

Annotated Bibliography on Elk-Livestock-Range Interactions
in Western Canada and Northwestern U.S.A.
Specific to the Management of Elk and Livestock Within
the Waterton Biosphere Reserve

Edited by
David M. Poll and John G. Stelfox

Compiled by
Stephanie Ibach



CANADIAN WILDLIFE SERVICE —

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**Produced by
Canadian Wildlife Service, Edmonton
for
Parks Canada, Western Region
March, 1985**

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INTRODUCTION

This bibliography was prepared for Parks Canada as a result of a literature review conducted for the study of elk-livestock-range interactions within the Waterton Biosphere Reserve. One of four information requirements in the Terms of Reference for the two-year (1984-1986) study entitled *Assessment of Elk Habitat Requirements Plus Seasonal Distributions of Elk and Livestock as Related to Environmental Conditions* required a literature review of elk-livestock-range interactions and the preparation of an annotated bibliography of elk-livestock-range ecology and interactions.

The compilation was selective, being specific to literature relevant to western Canada and northwestern United States. Citations were categorized into one of three "Areas" according to its relevance to the Waterton Biosphere Reserve: Area A, southwestern Alberta; Area B, western Canada; and Area C, northwestern U.S.A. and other relevant areas.

Literature was accessed from numerous sources including university and government departmental libraries, computer data bases and other published bibliographies and workshop proceedings (see Appendix I for listing of source locations). References were annotated, categorized by relevant subject area and compiled onto magnetic disc at University of Alberta Computing Services.

On-line searching capability was achieved through the use of the SPIRES (Stanford Public Information Retrieval System) data base management system at the University of Alberta. This system provides an efficient and versatile storage, retrieval and indexing facility which is easily used and can be continually updated. Appendix II gives instructions for accessing the elk-livestock-range bibliography ('ELK.BIB') subfile through *SPIRES at the University of Alberta Computing Services.

This report, which groups references alphabetically by subject, was produced through *SPIRES and the *TEXTFORM text processing and editing program also supported by the University of Alberta.

Numerous individuals and institutions provided assistance in accessing material for this bibliography. Special thanks are due the following for their assistance:

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Thanks are also due Park Superintendent Dr. Bernie Loeff, Chief Warden Max Winkler and Warden Derek Tilson of Waterton Lakes National Park and Patricia Benson, Parks Canada, Western Region, Calgary for their support of and assistance with this project. Ranchers who contributed information include Charles Russell and Mike Cowley of Twin Butte, Alberta.

Finally, we acknowledge with great appreciation the contributions of Janet Makarenko, SPIRES Consultant, University of Alberta, who provided much needed expertise in the development of this data base.

 BEHAVIOUR - GENERAL (BE1)

EL0020

Boyce, M.S. and L.D. Hayden-Wing Eds. 1979.
 North American elk : ecology, behavior and management.
 Univ. of Wyoming. Laramie, Wyoming.

An extensive collection of articles dealing with population biology, habitat ecology, behavior, pathology and nutrition, and management of elk in North America.

Subject: RA1 BE1 PD1 MA1 Area: B Source: CWSE

EL0060

Geist, V. 1978.
 Adaptive strategies in the behavior of elk.
 Faculty Environmental Design, Univ. of Calgary. Calgary, Alberta.

Studies how various species of elk behave, especially in the area of reproduction.

Subject: BE1 Area: C Source: KPNL

EL0127

Murie, O.J. 1951.
 The elk of North America.
 Wildl. Manage. Inst. Washington, D.C.

Very detailed book which discusses many aspects of elk in North America. Topics covered are : history, habitat, migration, physical characteristics, reproduction, mortality factors, diseases and parasites, food habits, population dynamics and management.

Subject: PD1 BE1 MF1 MA1 Area: B Source: CWSE WNPL

EL0243

Redgate, R.M. 1978.
 Behavioural and ecological considerations in the management of elk in Camp 1, Athabasca Valley, Alberta.
 M.E.Des. Thesis, Univ. of Calgary. Calgary, Alberta.

Outlines a study of the behavior and ecology of Rocky Mountain elk (*Cervus elaphus nelsoni*) during the summers of 1976 and 1977 between Jasper and Hinton, Alberta. The objectives of the project were to gain insights into the adaptive strategies of elk, to examine the impact of clearcut logging on elk, and to develop a management programme for elk.

Subject: MA4 BE1 Area: B Source: UOCL CWSE

EL0157

Schmidt, J.L. and eds. D.L. Gilbert 1980.
Big game of North America, ecology and management.
 Stackpole Books. Harrisburg, Pennsylvania.

A good reference on the ecology and management of the big game of North America. Includes short articles on various animals, and concludes with a series of reports dealing specifically with habitat and management problems.
 Subject: BE1 MA1 RA1 PD1 Area: B Source: AFWL AFWE

EL0179

Stelfox, J.G. and R.D. Taber. 1969.
Big game in the northern Rocky Mountain coniferous forest.
 Univ. of Montana Foundation. Missoula, Montana.
 Coniferous Forests of the Northern Rocky Mountains : Proceedings of the 1968 Symp.:197-222.

Discusses range vegetation, seasonal distributions and management techniques for big game (wapiti, deer, moose, caribou, bison, mountain goats and bighorn sheep) in the coniferous forests of the northern Rocky Mountains.
 Subject: BE1 BE2 MA1 Area: B Source: CWSE

EL0183

Struhsaker, T.T. 1967.
Behavior of elk (Cervus canadensis) during the rut.
 Z. Tierpsychol. 24:80-114.

Presents detailed descriptions of elk behavior observed during the rut and quantitative data on certain aspects of these behavior patterns. The study was conducted in the Rocky Mountains of Banff National Park, Alberta.
 Subject: BE1 NP4 Area: B Source: CWSE

EL0189

Thomas, J.W. and D.E. Toweill. 1982.
Elk of North America, ecology and management.
 Stackpole Books. Harrisburg, Pennsylvania.

A collection of articles dealing primarily with the ecology and management of the elk of North America. Some specific topics are : classification and distribution, physiology, diseases and parasites, behavior, habitat and food preferences, land and elk management, and recreational use of elk. Very detailed analysis of the subject matter.
 Subject: PD1 BE1 MA1 Area: B Source: AFWL

SEASONAL DISTRIBUTION AND MIGRATION (BE2)

EL0151

Anonymous. 1971.

Elk census 1971, Waterton Lakes National Park.
Warden Serv. Waterton Lakes National Park, Alberta.

Documents migrational trend, winter utilization of range, and population density of elk on Stony Flats, Waterton Lakes National Park. Some management recommendations are included.

Subject: PD5 BE2 RA3

Area: A Source: WNPL

EL0009

Armstrong, G.S. 1967.

Big game aerial surveys of the foothills and sub-alpine areas, 1967.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Documents results of an aerial survey for big game (elk, moose and mule deer) in the Lethbridge biological district. Covers the period from Jan., 1966 to May, 1967.

Subject: PD5 BE2

Area: B Source: AFWL

EL0018

Blood, D.A. 1966.

Aerial census of ungulates, Elk Island National Park, winter 1965-1966.
Project M1-1-4, Can. Wildl. Serv. Edmonton, Alberta.

Documents the seasonal distribution of elk in Elk Island National Park, Alberta, during the winter of 1965-1966.

Subject: BE2 PD5

Area: B Source: CWSE

EL0022

Brady, K.S. 1973.

Ungulate abundance and distribution, Waterton Lakes National Park.
Warden Serv. Waterton Lakes National Park, Alberta.

The report outlines the abundance and distribution of ungulates in Waterton Lakes National Park from March, 1971 to Nov., 1973. Six ungulate species are dealt with, with an outline of status, distribution, and habitat preference, followed by general remarks.

Subject: BE3 PD5 BE2

Area: A Source: AFWL

EL0023

Brady, K.S. 1975.

A report on wildlife numbers and distribution.
Warden Serv. Waterton Lakes National Park, Alberta.

Documents the results of a wildlife census and distribution survey conducted in Waterton Lakes National Park during the period of Jan., 1974 to Feb., 1975. Results are included in both discussion and table form. Methodology is given some discussion.

Subject: BE2 PD5 RT4

Area: A Source: AFWL

EL0026

Cairns, A.L. 1974.

Comparative distribution patterns of moose, wapiti and deer during mild and severe winters in Elk Island National Park.
 Can. Wildl. Serv. Edmonton, Alberta.

Discusses and compares the effect of weather on the winter distributions of moose, wapiti and deer in Elk Island National Park, Alberta. Aerial surveys and ground counts during mild and severe winters were used as data.

Subject: BE2 BE3 Area: B Source: CWSE

EL0232

Christiansen, J.M. 1972.

Aerial survey of ungulates in Waterton Lakes National Park.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Gives results from the February 1972 annual survey of ungulates in Waterton Lakes National Park, Alberta. Distribution maps show relative number of animals for each species, while tables relate numbers, sex, place, elevation, and aspect.

Subject: BE2 PD5 Area: A Source: CWSE WNPL

EL0030

Clark, J. 1980.

Region 1 elk survey : February 16 and 17, 1980.
 Alta. Energy and Nat. Res., Fish and Wildl. Div. Lethbridge, Alberta.

Documents the numbers of elk seen on the winter ranges of the Region 1 area, Alberta. The distribution and trend data received from this is then used as a guide for season setting and female authorization allocations.

Subject: PD5 BE2 Area: A Source: AFWL

EL0045

Dwyer, M.V. 1969.

The ecological characteristics and historical distribution of the family Cervidae in Alberta.
 MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Dissertation traces historical distribution of Cervidae members indigenous to Alberta. Review intraspecific and interspecific relationships and forage requirements of the family Cervidae in general. Each species is then discussed individually with a description of the species, ecology, and summary of the historical distribution. A map of present day distribution is included as well.

Subject: PD2 BE2 BE4 Area: A Source: AFWL

EL0058

Froggatt, K. and B. Hali. 1976.

Region 1 elk survey.
 Alta. Recreation and Parks, Fish and Wildl. Div. Lethbridge, Alberta.

Gives elk aerial survey results for 1976 in the Lethbridge region.

Subject: PD5 BE2 Area: A Source: AFWL

EL0062

Gibbons, T. and K. Baker. 1976.
Elk study, Kootenay National Park - interim report.
Indian and Northern Affairs, Parks Canada.

Documents seasonal elk distribution in and around Kootenay National Park during 1975 and 1976. Techniques used include immobilization, and monitoring using radio collars and colored neck bands.
Subject: BE2 RT7 Area: B Source: KPWL

EL0061

Gibbons, T.R. 1978.
Kootenay National Park, elk study, 1976-1978.
Parks Canada.

Documents techniques used when determining migration patterns of elk in Kootenay National Park. Immobilization and radio collars were the main methods used.
Subject: RT7 BE2 Area: B Source: KPWL

EL0070

Gudmundson, L. 1977.
Region 1 elk survey (March 1977).
Alta. Recreation, Parks and Wildl., Fish and Wildl. Div. Lethbridge, Alberta.

Gives results of the March 1977 aerial elk survey which was completed in order to gain knowledge of the wintering population as well as the distribution of the animals.
Subject: PD5 BE2 Area: A Source: AFWL

EL0072

Hall, B. 1974.
Region 1 foothills elk survey.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Documents the results of an aerial elk survey (March 13, 14, 1974) of the Region 1 foothills. Gives population numbers, locations, and observations of neck collars encountered.
Subject: PD5 BE2 Area: A Source: AFWL

EL0073

Hall, B., K. Froggatt and A. Cook. 1975.
Region 1 elk survey.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Presents and discusses results from an aerial survey of elk in Region 1 on March 13, 1975.
Subject: PD5 BE2 Area: A Source: AFWL

EL0091

Kerr, G.R. 1964.
Big game aerial survey.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge,
Alberta.

Documents the results of an aerial survey for big game in District #1 in
Alberta. Gives information on elk, deer, moose and other animals observed
and classified.

Subject: BE2 PD2 RT4

Area: B

Source: AFWL

EL0098

Knowles, C.J. and R.B. Campbell. 1981.
Distribution of elk and cattle in a rest-rotation grazing system.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
20-22, 1981:47-60.

Discusses the distributional relationships of elk and cattle in a rest-rotation
grazing system in the Missouri River breaks of north-central Montana. The
study was conducted in the period from 1973 to 1976.

Subject: BE4 RA4 MA2 BE2

Area: B

Source: AFWL

EL0116

Martinke, C.J. 1969.
Ungulate winter ecology studies, Glacier National Park.
National Park Serv. Prog. Report, 1968-1969. Glacier National Park,
Montana.

Compiles quantitative data on winter distribution, movements, population
dynamics, habitat relationships, and ecology of elk (*Cervus canadensis*) and
mule deer. The main study area was the Middle Fork Flathead River
drainage, and further studies were conducted on the Belton Hills winter range,
and throughout the Middle Forks drainage in Glacier National Park, Montana.

Subject: PD1 BE2 BE3 BE4

Area: B

Source: WNPL

EL0143

Ormiston, J.H. 1968.
Big game survey and investigations - High Rye elk winter range.
Wildl. Investigations, Project W-73-R-10, State of Montana. Helena,
Montana.

Objectives of this study were to gain data on range trend and condition.
This was then used to evaluate past and present elk densities and distributions
. Future management considerations were then discussed, using the data as
criterion. The study area is the High Rye elk winter range in Montana.

Subject: RA5 BE2

Area: B

Source: AFWL

EL0146

Peek, J.M. and A.L. Lovaas. 1968.
Differential distribution of elk by sex and age on the Gallatin winter range,
Montana.
J. Wildl. Manage. 32(3):553-557.

Documents the distributions of elk (*Cervus canadensis*) by sex and age on the
Gallatin elk winter range in Montana from 1958 to 1963.

Subject: BE2 RA3

Area: B

Source: UOAL

EL0170

Stelfox, J.G. 1964.
 Elk in northwestern Alberta.
 Land-Forest-Wildl. 6(5):14-23.

Describes the historical and present population status of wapiti in northwestern Alberta. Four herds (Brazeau, Hinton, Jasper and Peace River) are specifically dealt with, and a map indicating the present and past distribution is included.
 Subject: PD2 BE2 Area: B Source: CWSE

EL0171

Stelfox, J.G. 1964.
 Bighorn ecological study in the Coalbranch Region (Drummond Creek south to Ruby Creek).
 Fish and Wildl. Div., Alta. Dept. Lands and Forests. Edmonton, Alberta.

Documents range conditions, distribution and population of bighorn sheep and elk herds in the Drummond-Ruby Creek Region of the Coalbranch, in order that some effective management proposals could be outlined.
 Subject: RA5 BE2 PD5 Area: B Source: CWSE

EL0169

Stelfox, J.G. 1961.
 Effects of harvesting coniferous forests in western Alberta on big game.
 Alta. Fish and Wildl. Edmonton, Alberta.

This paper deals with a study on plant species, numbers, canopy coverage, browse forage yields and heights, utilization, seasonal big game numbers and distribution in a mature white spruce forest and during the first five plant successional years. Logged over areas that have been scarified are compared to unscarified areas. Study area is located near Hinton, Alberta. Relates how harvesting coniferous forests effect big game.
 Subject: RA4 BE2 MA4 Area: B Source: CWSE

EL0176

Stelfox, J.G. 1974.
 Caribou - elk - human interrelationship study, Skyline Trail, Maligne Mountains, Jasper National Park.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Details a study done to determine the interrelationships of caribou, elk and human beings in Jasper National Park. Correlates distribution patterns for each species, and behavior patterns when any two species came in contact.
 Subject: BE2 BE4 BE6 Area: B Source: CWSE

EL0179

Stelfox, J.G. and R.D. Taber. 1969.
 Big game in the northern Rocky Mountain coniferous forest.
 Univ. of Montana Foundation. Missoula, Montana.
 Coniferous Forests of the Northern Rocky Mountains : Proceedings of the 1968 Symp.:197-222.

Discusses range vegetation, seasonal distributions and management techniques for big game (wapiti, deer, moose, caribou, bison, mountain goats and bighorn sheep) in the coniferous forests of the northern Rocky Mountains.

Subject: BE1 BE2 MA1

Area: B

Source: CWSE

EL0178

Stelfox, J.G. and Jasper National Park. Warden Service 1974.
 The abundance and distribution of caribou and elk in Jasper National Park,
 1971 to 1973.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

A detailed study which investigates the abundance and distribution, habitat
 preference, population dynamics and climate as related to distributions of
 caribou and elk in Jasper National Park from 1971 to 1973.
 Subject: BE2 BE3 Area: B Source: CWSE

EL0203

Wasem, R.C. 1968.

Aquatic ecology studies and banded elk movement studies.
 Office of Natural Science Studies, National Park Serv. Washington, D.C.

Documents the movements and locations of banded elk tagged in Waterton
 Lakes and Glacier National Parks from 1966 to 1968. Detailed discussion of
 handling and marking technique is given.
 Subject: BE2 RT7 Area: A Source: AFWL WNPL

EL0205

Watt, R. 1983.

Wildlife survey, Waterton Lakes National Park.
 Waterton Lakes National Park Warden Serv. Waterton Lakes National Park,
 Alberta.

Documents results of aerial and ground surveys of wildlife in Waterton Lakes
 National Park, Feb. 3, 1983. Details of methods used and costs incurred are
 included.
 Subject: RT4 BE2 Area: A Source: AFWL

EL0204

Watt, R. 1983.

Wildlife survey - March 26, 1983, Waterton Lakes National Park.
 Waterton Lakes National Park Warden Serv. Waterton Lakes National Park,
 Alberta.

Documents the results of aerial and ground surveys of wildlife in Waterton
 Lakes National Park, March 26, 1983. Details of methods used and costs
 incurred are included.
 Subject: RT4 BE2 Area: A Source: AFWL

EL0207

Webb, R. 1965.

Elk and deer fall and winter aerial surveys.
 Fish and Wildl. Div., Alta. Dept. Lands and Forests, Edmonton.

Objectives : a) general reconnaissance to determine hunting season and winter
 locations of elk, sheep and deer herds, b) to determine the status of some
 major elk populations in District I with particular emphasis on the Oldman
 River herd, c) to determine the seasonal distributions of the Oldman River
 herd in relation to climatic factors, d) to gather sex and age classification

data describing District I deer and elk populations.
 Subject: PD5 BE2 Area: B Source: AFWL

HABITAT SELECTION (BE3)

EL0013

Beall, R.C. 1974.
 Winter habitat selection and use by a Western Montana elk herd.
 PhD. Thesis, Univ. of Montana. Missoula, Montana.

Evaluates winter habitat selection and use by a western Montana elk herd from June, 1969 to March, 1973. Looks at usage and selection in terms of activities, ambient meteorological and radiation conditions, and seasonal changes. The methods used were outlined in detail.
 Subject: RT3 BE3 Area: B Source: LARS

EL0014

Berg, B.P. 1983.
 Wild and domestic ungulate interactions in the Bob Creek Area, southwestern Alberta.
 MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Examines the interactions, patterns, differences and implications of management of resource interactions of elk (*Cervus elaphus nelsoni*), mule deer and cattle in the area around Bob Creek, southwestern Alberta. The types of resource use discussed are: seasonal use, spatial and topographical use, the use of plant communities, diets, environmental selection, and activity and range use. A discussion follows dealing with the resource division among the ungulates. Details of methods used, and management suggestions for grazing are included.
 Subject: RA2 BE3 MA2 Area: A Source: LARS

EL0021

Boyd, R.J. 1980.
 American elk. In Big game of North America, ecology and management., Schmidt and Gilbert, Eds.
 Stackpole Books. Harrisburg, Pennsylvania.

General description of American elk : their distribution, physical characteristics, life history, population dynamics, habitat, and management. A good overview on the life of wapiti in North America.
 Subject: PD1 BE3 MA1 Area: B Source: AFWL

EL0024

Brady, K.S. 1978.
 Elk pellet group study, Waterton Lakes National Park.
 Warden Serv. Waterton Lakes National Park, Alberta.

Determines the actual or relative number of ungulates (particularly elk) by fecal pellet group counts, documents animal days use in the study areas,

discusses techniques for future monitoring of the herd, and looks at the accuracy of the pellet group count method. Some recommendations for species and habitat management are included as well.

Subject: BE3 RT4 Area: A Source: WNPL

EL0022

Brady, K.S. 1973.

Ungulate abundance and distribution, Waterton Lakes National Park.
Warden Serv. Waterton Lakes National Park, Alberta.

The report outlines the abundance and distribution of ungulates in Waterton Lakes National Park from March, 1971 to Nov., 1973. Six ungulate species are dealt with, with an outline of status, distribution, and habitat preference, followed by general remarks.

Subject: BE3 PD5 BE2 Area: A Source: AFWL

EL0026

Cairns, A.L. 1974.

Comparative distribution patterns of moose, wapiti and deer during mild and severe winters in Elk Island National Park.
Can. Wildl. Serv. Edmonton, Alberta.

Discusses and compares the effect of weather on the winter distributions of moose, wapiti and deer in Elk Island National Park, Alberta. Aerial surveys and ground counts during mild and severe winters were used as data.

Subject: BE2 BE3 Area: B Source: CWSE

EL0027

Capp, J.C. 1967.

Competition among bighorn sheep, elk and deer in Rocky Mountain National Park, Colorado.

M.Sc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Discusses the vegetative composition and climate of the range and the usage, by various types of ungulates. The seasonal movements and distributions, and occupancy of habitat types, and food preferences for each of sheep, elk and deer in Rocky Mountain National Park, Colorado are given. Competition for range between these three ungulates is analyzed in terms of the above.

Subject: RA2 BE3 Area: B Source: CWSE

EL0246

Collins, W.B. 1979.

Feeding behavior and habitat selection of deer and elk on northern Utah summer range.

M.Sc. Thesis, Utah State Univ., Dept. Range Science, Logan, Utah.

Examined feeding behaviour and habitat preferences of mule deer and elk in aspen and lodgepole pine habitat types. Purpose was to determine where deer and elk prefer to graze and rest within these habitat types and to consider what species-specific characteristics contribute to their differing forage and habitat preferences.

Subject: BE4 BE3 NP2 Area: B Source: UOAL

EL0034

- Collins, W.B., P.J. Urness and D.D. Austin. 1978.
Elk diets and activities on different lodgepole pine habitat segments.
J. Wildl. Manage. 42(4):799-810.

Determines bi-weekly diets, dietary consumption rates, activity patterns, and relative habitat-segment preferences of unconfined elk on different segments of lodgepole pine summer range. The study area is the Little Brush Creek drainage of the Ashley National Forest, Utah.
Subject: BE3 NP2 NP4 Area: B Source: LARS

EL0039

- Cowan, I.McT. 1950.
Some vital statistics of big game on overstocked mountain range.
Trans. Fifteenth North Amer. Wildl. Conf., San Francisco, California.
March 6-9, 1950:581-588.

Discusses sex ratios, fertility and effective reproduction of big game animals on overstocked mountain range in Banff, Jasper, Kootenay and Yoho National Parks. Includes a description of range vegetation and utilization.
Subject: PD4 RA2 BE3 Area: B Source: UOAL

EL0059

- Gates, C.C. 1980.
Patterns of behavior and performance of wapiti (*Cervus elaphus nelsoni*) in the boreal mixed wood forest.
PhD. Thesis, Univ. of Alta. Edmonton, Alberta.

Study investigates the behavior and productivity of wapiti in relation to seasonal changes in physical and biotic elements of a boreal mixed wood environment in central Alberta. Aspects of behavior studied include foraging and habitat selection, activity budgets, Circadian activity patterns, and weight dynamics.
Subject: BE3 NP4 RT5 BE5 Area: B Source: UAAS

EL0075

- Hansen, R.M. and 1975.
Diet overlap of deer, elk and cattle in southern Colorado.
J. Range Manage. 28(1):43-47.

Seasonal dietary overlaps for mule deer, elk and cattle were estimated through analysis of fecal samples taken from Dec. 1970 to Nov. 1971. The study area was a private ranch in Colorado.
Subject: BE3 NP2 RT11 Area: B Source: AFWL

EL0080

- Houston, D.B. 1971.
The status of research on ungulates in northern Yellowstone National Park.
Amer. Assoc. for the Advancement of Science Symp. on Research in National Parks. Dec. 28, 1971.

Description of the studies being conducted in northern Yellowstone National Park. The paper places emphasis on elk (*Cervus canadensis*) but also includes other ungulates. Hypotheses given relate to ungulate habitat relationships, biotic succession and ecological homeostasis.
Subject: BE3 Area: C Source: CWSE

EL0082

Hudson, R.J. 1977.

Habitat utilization and resource partitioning by wild ruminants : multivariate analysis of nominally-sealed attribute data.
Northwest Science 51(2):101-110.

Describes how a multivariate nominal scale analysis technique was applied to the study of habitat use and resource partitioning in a western Canadian grazing system. The study area was Premier Ridge, B.C., and the ungulates involved were whitetailed and mule deer, elk, and bighorn sheep.
Subject: RT2 RA2 BE3 Area: B Source: LARS

EL0081

Hudson, R.J. 1972.

Integrated use of grazing resources.
Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29, 1972:21-31.

Discusses factors influencing the interactions of domestic and wild ungulates, and how to organize management procedures which would reduce the competition among animals, in light of these factors.
Subject: MA2 RA2 BE3 BE4 Area: P Source: LARS

EL0083

Hudson, R.J. and V.C. Brink. 1976.

Occupational patterns of wildlife on a major East Kootenay winter-spring range.
J. Range Manage. 29(1):38-43.

Investigates range vegetation and domestic livestock as being important factors in the distributions and range usages of deer, elk and bighorn sheep. Methods of observation were discussed. The study area was Premier Ridge, British Columbia.
Subject: RA2 BE3 Area: B Source: CWSE

EL0084

Hudson, R.J., W.D. Kitts and V.C. Brink. 1972.

Habitat utilization by wildlife and livestock in the southern Rocky Mountain Trench, British Columbia.
Environment Canada. Edmonton, Alberta.

Discusses habitat use by cattle, deer, elk and bighorn sheep in the southern Rocky Mountain Trench in British Columbia. Range production and utilization, habitat, competition, nutrition, and some techniques used for the study are included.
Subject: BE3 RT2 RA2 RA4 Area: B Source: CWSE

EL0088

Jones, W.B. 1965.

Response of major plant species to elk and cattle grazing in northwestern Wyoming.
J. Range Manage. 18(4):218-220.

Studied the difference between elk range, cattle range, and ungrazed range in northwestern Wyoming.
Subject: RA2 MA2 BE3 Area: B Source: UABA

EL0089

Julander, O. and D.E. Jeffrey. 1964.

Deer, elk and cattle range relations on summer range in Utah.
Trans. North Amer. Wildl. Nat. Resources Conf. 29:404-414.

Discusses range utilization and forage preferences for deer, elk and cattle on the Willow Creek range, Utah.

Subject: RA4 BE3 NP2

Area: B

Source: UABA

EL0093

Kirsch, J.B. 1962.

Range use, relationship to logging, and food habits of the elk in the Little Belt Mountains, Montana.

MSc. Thesis, Montana State College. Bozeman, Montana.

Investigates distribution, movement, range use, food habits, and the relationships to block clear cut logging of lodgepole pine of elk in the Little Belt Mountains in Montana. Relates elk movements and range use to broadly designated plant communities, and correlates size, age, and moisture conditions of the pine clear cuts with elk usage. Outlines a vegetational analysis of two clear cuts and the uncut lodgepole to compare changes resulting from logging.

Subject: BE3 RA4 MA4

Area: C

Source: CWSE

EL0102

Leege, T.A., M.W. Schlegel and T.J. Hershey. 1976.

Elk ecology.

Idaho Dept. of Fish and Game, Project W-160-R-3. Idaho.

This project is divided into nine separate studies: Range rehabilitation, spring vs fall burning for range, ecological study, population dynamics and movements of the Loscha elk herd, immobilizing equipment and new drugs, range improvement through vegetal manipulation, elk research projects, and description of habitat needs of elk during different seasons. The study area is along the slopes of Fish Creek in the Loscha River drainage, Idaho.

Subject: MA2 BE3 RA3

Area: B

Source: CWSE

EL0104

Long, A.J. and L.L. Irwin. 1981.

Elk - cattle interactions in the Bighorn Mountains, Wyoming.

Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:553-564.

Studies the relationship between cattle and elk near Tensleep, Wyoming. Determines the habitat preferences of elk and cattle, and relates these to forage characteristics (i.e. species composition, forage availability, etc.). Also discusses various factors influencing fluctuation in nutrient levels.

Subject: BE3 RT2 RA2

Area: B

Source: AFWL

EL0108

Lyon, L.J. 1979.

Habitat effectiveness for elk as influenced by roads and cover.

J. Forestry 77(10):658-660.

Discusses habitat with respect to influence by roads and cover, on elk in western Montana.

Subject: BE3 BE6

Area: C

Source: KPWL

EL0112

Mackie, R.J. 1965.

Range ecology and relations of mule deer, elk, and cattle in the Missouri River breaks, Montana.

PhD. Thesis, Montana State College. Bozeman, Montana.

Describes differences and similarities in habitat selection and range use competition between elk, mule deer, and cattle in the Missouri River breaks, Montana. Relates ungulate temporal and spatial distribution, and forage preferences to composition, abundance and intensity of range forage.

Subject: RA2 BE3 RA4

Area: B

Source: LARS

EL0114

Marcum, C.L. 1975.

Summer - fall habitat selection and use by a western Montana elk herd.

PhD. Thesis, Univ. of Montana. Missoula, Montana.

Outlines an investigation into the summer-fall habitat selection and use by an elk herd in western Montana, from 1971 through 1973. Evaluates the interrelations between elk and various biological and physical habitat factors, based on the data. Discussion of techniques used was quite extensive.

Subject: BE3 RT3

Area: B

Source: LARS

EL0002

Marcum, C.L. 1976.

Habitat selection and use during summer and fall months by a western Montana elk herd.

Elk-Logging-Roads Symp. Proc., Moscow, Idaho. 1976:91-96.

Annotation not available.

Subject: BE6 MA4 BE3

Area: B

Source: DIAL

EL0115

Martinka, C.J. 1969.

Population ecology of summer resident elk in Jackson Hole, Wyoming.

J. Wildl. Manage. 33(3):465-481.

Documents distribution, population status, social habits, movements and habitat relationships of elk (*Cervus canadensis*) in Jackson Hole, Wyoming.

Subject: BE3 PD1

Area: B

Source: UOAL

EL0116

Martinke, C.J. 1969.

Ungulate winter ecology studies, Glacier National Park.

National Park Serv. Prog. Report, 1968-1969. Glacier National Park, Montana.

Compiles quantitative data on winter distribution, movements, population dynamics, habitat relationships, and ecology of elk (*Cervus canadensis*) and mule deer. The main study area was the Middle Fork Flathead River drainage, and further studies were conducted on the Belton Hills winter range, and throughout the Middle Forks drainage in Glacier National Park, Montana.

Subject: PD1 BE2 BE3 BE4

Area: B

Source: WNPL

EL0121

Morgantini, L.E. 1979.

Habitat selection and resource division among bighorn sheep, elk and mule deer in western Alberta.

MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Discusses the habitat of, and the manner in which the species co-exist through division of habitat, of the Rocky Mountain bighorn sheep, elk and mule deer in the Red Deer River Valley, central-western Alberta. Tries to define the operational components which have an effect on the animals, and caused a behavioral or physiological response.

Subject: BE3 BE4

Area: B

Source: UOAL CWSE

EL0122

Morgantini, L.E. and R.J. Hudson. 1979.

Human disturbance and habitat selection in elk. In North American elk : ecology, behavior and management., Boyce and Hayden-Wing, Eds.
Univ. of Wyoming, Laramie.

Discusses how human disturbances such as traffic influenced habitat selection of elk on the Ya Ha Tinda Ranch in western Alberta.

Subject: BE3 BE6

Area: B

Source: CWSE

EL0140

Oldemeyer, J.L. 1966.

Winter ecology of bighorn sheep in Yellowstone National Park.

MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Although primarily concerned with sheep, this dissertation presents a lengthy discussion on elk competition with the bighorn sheep of this area.

Subject: RA2 BE3

Area: B

Source: ANNB

EL0147

Rault, D. 1972.

Ungulate pellet group study, Waterton Lakes National Park, May, 1972.
Warden Serv. Waterton Lakes National Park, Alberta.

Determines habitat types and degree of habitat use by different species of ungulates, using fecal pellet group counts. Discusses the accuracy of this method.

Subject: RT3 RT4 BE3

Area: A

Source: WNPL

EL0148

Ream, B., B. Beall and L. Marcum. 1971.

Sapphire Range elk ecology study - elk, logging and people.

School of Forestry, Univ. of Montana. Montana.

Outlines a study of elk on the Sapphire range, Montana. Main topics include capture and marking of elk, and their habitat use and food preferences. Some information on logging, and the effects of that on the range is given.

Subject: BE3 MA4 NP2

Area: B

Source: CWSE

EL0149

Reid, L.D. 1973.

Diet similarity between mule deer, elk and cattle in south-central Colorado.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Discusses range relationships, interspecific competition and forage preferences for mule deer, elk and cattle, and the factors which influence the magnitude of these relationships. The study area is south-central Colorado. Included is an extensive literature review on this subject.

Subject: BE3 BE4 RA2 NP2 Area: B Source: LARS

EL0152

Reynolds, H.G. 1966.

Use of openings in spruce-fir forests of Arizona by elk, deer and cattle.
Forest Serv., U.S. Dept. of Agric. Arizona.

Documents elk, deer and cattle usage of natural and created openings on spruce-fir forests in the Burro Mountains, the White Mountains, and the Kaibab Plateau of Arizona.

Subject: RA7 BE3 Area: B Source: CWSE

EL0162

Skovlin, J.M., P.J. Edgerton and R.W. Harris. 1968.

The influence of cattle management on deer and elk.
23rd North Amer. Wildl. Conf, March 11-13, 1968:169-181.

Studies the relationship between big game and cattle range usage in the Blue Mountains of Oregon and Washington. Looks into the reasons behind the differing yearly and seasonal use. Methods used are outlined in detail.

Subject: MA2 RA2 RT3 BE3 Area: B Source: LARS UOAL

EL0178

Stelfox, J.G. and Jasper National Park. Warden Service 1974.

The abundance and distribution of caribou and elk in Jasper National Park, 1971 to 1973.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

A detailed study which investigates the abundance and distribution, habitat preference, population dynamics and climate as related to distributions of caribou and elk in Jasper National Park from 1971 to 1973.

Subject: BE2 BE3 Area: B Source: CWSE

EL0180

Stevens, D.R. 1966.

Range relationships of elk and livestock, Crow Creek Drainage, Montana.
J. Wildl. Manage. 30(2):349-363.

Examines the range relationship between elk (*Cervus canadensis*), cattle and sheep of the Crow Creek Drainage, Montana. The study period was 1963-1964, with the area studied covering 100,000 acres. Competition and usage between species was outlined.

Subject: RA2 BE3 Area: B Source: UABA

EL0211

Woolf, A. 1968.

Summer ecology of bighorn sheep in Yellowstone National Park.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Documents the problem of competition between sheep and elk in Yellowstone National Park. The dominant plant and staple foods of both species are discussed.

Subject: RA2 BE3 NP2

Area: B

Source: ANNB

INTERSPECIFIC RELATIONSHIPS (BE4)

EL0015

Berg, B.P. and R.J. Hudson. 1981.

Elk, mule deer, and cattle : functional interactions on foothills range in southwestern Alberta.

Proc. Wildl.-Livestock Relationships Symp., Couer d'Alene, Idaho. April 20-22, 1981:509-519.

Investigates food habits, use of habitats by elk, mule deer and cattle, and range condition and productivity. The study area was the foothills of southwestern Alberta. Also documents the amount of overlapping resource use between the three species.

Subject: BE4 RA4 RA2

Area: A

Source: AFWL

EL0246

Collins, W.B. 1979.

Feeding behavior and habitat selection of deer and elk on northern Utah summer range.

M.Sc. Thesis, Utah State Univ., Dept. Range Science, Logan, Utah.

Examined feeding behaviour and habitat preferences of mule deer and elk in aspen and lodgepole pine habitat types. Purpose was to determine where deer and elk prefer to graze and rest within these habitat types and to consider what species-specific characteristics contribute to their differing forage and habitat preferences.

Subject: BE4 BE3 NP2

Area: B

Source: UOAL

EL0035

Constan, K. 1967.

Bighorn sheep range use, food habits and relationships to mule deer and elk in Gallatin Canyon.

Big Game Research, Montana Fish and Game Dept. Montana.

Detailed description of range use, food habits and interspecific relationships of bighorn sheep, mule deer and elk. Some research techniques were also included. The study was conducted in Gallatin Canyon, in southwestern Montana.

Subject: RA4 BE4 NP2

Area: B

Source: CWSE

EL0036

Constan, K.J. 1972.

Winter foods and range use of three species of ungulates.

J. Wildl. Manage. 36(4):1068-1076.

Documents range usage, food habits, population characteristics and interspecific relationships of bighorn sheep, mule deer, and elk on the Deer Creek-Asbestos Creek winter-spring range in Gallatin Canyon, southwestern Montana.

Subject: BE4 NP2 RA4

Area: B

Source: UOAL

EL0045

Dwyer, M.V. 1969.

The ecological characteristics and historical distribution of the family Cervidae in Alberta.

MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Dissertation traces historical distribution of Cervidae members indigenous to Alberta. Review intraspecific and interspecific relationships and forage requirements of the family Cervidae in general. Each species is then discussed individually with a description of the species, ecology, and summary of the historical distribution. A map of present day distribution is included as well.

Subject: PD2 BE2 BE4

Area: A

Source: AFWL

EL0046

Eastman, D.S. 1972.

Current knowledge of ungulate competition in southern British Columbia.

Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29, 1972:40-51.

Discusses wild-domestic ungulate competition in various regions of southern British Columbia. Gives a list of measurements which must be obtained in order to determine the level of competition. Management suggestions are made to lessen this level of competition.

Subject: RA2 BE4 MA3

Area: B

Source: LARS

EL0063

Gordon, F.A. 1968.

Range relationships of elk and cattle on elk winter range, Crow Creek, Montana.

Big Game Research Project, State of Montana.

Studies food habits, range distribution, forage utilization, and interspecific relationships of elk and cattle from 1967-1969 on the Crow Creek Drainage, Montana. Some history of elk and cattle usage was given as well as a description of the physiography and vegetation.

Subject: RA4 BE4 NP2

Area: B

Source: AFWL

EL0081

Hudson, R.J. 1972.

Integrated use of grazing resources.

Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29, 1972:21-31.

Discusses factors influencing the interactions of domestic and wild ungulates, and how to organize management procedures which would reduce the competition among animals, in light of these factors.

Subject: MA2 RA2 BE3 BE4 Area: B Source: LARS

EL0098

Knowles, C.J. and R.B. Campbell. 1981.

Distribution of elk and cattle in a rest-rotation grazing system.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
20-22, 1981:47-60.

Discusses the distributional relationships of elk and cattle in a rest-rotation grazing system in the Missouri River breaks of north-central Montana. The study was conducted in the period from 1973 to 1976.

Subject: BE4 RA4 MA2 BE2 Area: B Source: AFWL

EL0235

Komberec, T.J. 1976.

Range relationships of mule deer, elk and cattle in a rest rotation grazing system during winter and spring.
MSc. Thesis, Montana State Univ. Montana.

Looks at the range relationships of mule deer, elk and cattle in Phillips County, Missouri River Basin, Montana. Study period was from July 1974 to December 1975.

Subject: RA2 BE4 Area: B Source: DIAL

EL0113

Mair, W.W. 1952.

The impact of an introduced population of elk upon the biota of Banff National Park.
M.A. Thesis, Univ. of B.C. Vancouver, British Columbia.

Detailed investigation into elk movements, food habits, range usage, and wildlife interactions in Banff National Park, Alberta.

Subject: RA4 BE4 NP2 PD2 Area: B Source: CWSE

EL0116

Martinke, C.J. 1969.

Ungulate winter ecology studies, Glacier National Park.
National Park Serv. Prog. Report, 1968-1969. Glacier National Park, Montana.

Compiles quantitative data on winter distribution, movements, population dynamics, habitat relationships, and ecology of elk (*Cervus canadensis*) and mule deer. The main study area was the Middle Fork Flathead River drainage, and further studies were conducted on the Belton Hills winter range, and throughout the Middle Forks drainage in Glacier National Park, Montana.

Subject: PD1 BE2 BE3 BE4 Area: B Source: WNPL

EL0132

McIntosh, B.J. and P.R. Krausman. 1981.

Elk and mule deer distributions after a cattle introduction in northern Arizona.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
20-22, 1981:545-552.

During the time period from June, 1979 to Nov. 1980, this study was done to test whether or not the introduction of cattle onto a grazing area of mule

deer and elk would effect the ungulate distributions. The distributions and movements of the deer and elk were tested one year prior to, and one year after the cattle were introduced. The study area was the Circle-Bar Pasture, in northern Arizona. Methodology was discussed in some detail.
 Subject: BE4 RA2 RT2 Area: B Source: AFWL AFWE

EL0121

Morgantini, L.E. 1979.

Habitat selection and resource division among bighorn sheep, elk and mule deer in western Alberta.

MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Discusses the habitat of, and the manner in which the species co-exist through division of habitat, of the Rocky Mountain bighorn sheep, elk and mule deer in the Red Deer River Valley, central-western Alberta. Tries to define the operational components which have an effect on the animals, and caused a behavioral or physiological response.

Subject: BE3 BE4 Area: B Source: UOAL CWSE

EL0123

Morris, M.S. 1956.

Elk and livestock competition.

J. Range Manage. 9(1):10 ff.

Discusses food and range requirements of elk and livestock, economic aspects of the problem of elk and livestock competition, and various elk management considerations for Montana. The general distributions of the animals are included.

Subject: BE4 RA2 MA4 Area: B Source: CWSE

EL0137

Neitfeld, M.T. 1983.

Foraging behavior of wapiti in the boreal mixed-wood forest, central Alberta.

MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Investigates food habits of wapiti with respect to available forage resources. Examines and compares seasonal food habits and foraging behavior in five different habitats, as important to wapiti in the mixed-wood boreal forest region. The study was conducted at the Ministik Wildlife Research Station, Alberta.

Subject: BE4 RA1 BE5 Area: B Source: UAAS

EL0138

Nelson, J.R. and D.G. Burnell.

Elk-cattle competition in central Washington.

Washington State Univ. Pullman, Washington.

Reviews factors influencing elk-cattle competition in central Washington. Some factors are diet similarity, availability, animal distribution patterns, timing and social interaction. Discusses a new analytical method used to correlate the data.

Subject: RA2 BE4 RT2 Area: B Source: LARS

EL0149

- Reid, L.D. 1973.
Diet similarity between mule deer, elk and cattle in south-central Colorado.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Discusses range relationships, interspecific competition and forage preferences for mule deer, elk and cattle, and the factors which influence the magnitude of these relationships. The study area is south-central Colorado. Included is an extensive literature review on this subject.

Subject: BE3 BE4 RA2 NP2 Area: B Source: LARS

EL0176

- Stelfox, J.G. 1974.
Caribou - elk - human interrelationship study, Skyline Trail, Maligne Mountains, Jasper National Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Details a study done to determine the interrelationships of caribou, elk and human beings in Jasper National Park. Correlates distribution patterns for each species, and behavior patterns when any two species came in contact.

Subject: BE2 BE4 BE6 Area: B Source: CWSE

FORAGING STRATEGIES (BE5)

EL0059

- Gates, C.C. 1980.
Patterns of behavior and performance of wapiti (*Cervus elaphus nelsoni*) in the boreal mixed wood forest.
PhD. Thesis, Univ. of Alta. Edmonton, Alberta.

Study investigates the behavior and productivity of wapiti in relation to seasonal changes in physical and biotic elements of a boreal mixed wood environment in central Alberta. Aspects of behavior studied include foraging and habitat selection, activity budgets, Circadian activity patterns, and weight dynamics.

Subject: BE3 NP4 RT5 BE5 Area: B Source: UAAS

EL0074

- Hanley, T.A. 1982.
Cervid activity patterns in relation to foraging constraints : western Washington.
Northwest Science 56(3):208-217.

Relates foraging group size and temporal, spatial patterns activity to seasonal changes in forage availability and quality. Specifically studied reproductive female Rocky Mountain elk and black-tailed deer.

Subject: BE5 RA4 Area: B Source: LARS

EL0241

Hudson, R.J. and M.T. Nietfeld. 1985.
Effect of forest depletion on the feeding rate of wapiti.
 J. Range Manage. 38(1):80-82.

Documents a study done which evaluated forage intake rates of wapiti (*Cervus elaphus nelsoni*) during the depletion of a grass sward over a 7-day period. Relates bite sizes to forage biomass and plant height.
 Subject: NP2 BE5 Area: B Source: UOAL

EL0137

Neitfeld, M.T. 1983.
Foraging behavior of wapiti in the boreal mixed-wood forest, central Alberta.
 MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Investigates food habits of wapiti with respect to available forage resources. Examines and compares seasonal food habits and foraging behavior in five different habitats, as important to wapiti in the mixed-wood boreal forest region. The study was conducted at the Ministik Wildlife Research Station, Alberta.
 Subject: BE4 RA1 BE5 Area: B Source: UAAS

EL0188

Telfer, E.S. 1974.
Vertical distribution of cervid and snowshoe hare browsing.
 J. Wildl. Manage. 38(4):944-946.

Describes a study done in southwestern Alberta on the vertical range over which browsing mammals feed. Animals studied were moose, elk, deer and cattle. Discusses the importance of this information in planning range surveys.
 Subject: RA5 BE5 Area: A Source: UOAL

RESPONSE TO HUMAN ACTIVITIES (BE6)

EL0247

Boltz, M.J. 1979.
Impacts of prescribed burns and clearcuts upon summer elk food habits, diet quality, and distribution in central Washington.
 M.Sc. Thesis, Washington State Univ.

Evaluated impacts of prescribed burns on elk distributions, food habits and diet quality in upper Naneum Creek, Kittitas County, Washington. Seasonal trend in elk habitat use were related to phenology and utilization-induced habitat changes.
 Subject: BE6 RA7 MA4 NP2 Area: B Source: UOAL

EL0076

Harrison, G., R. Hooper and P. Jacobson. 1982.
 Ungulate population statistics and habitat analysis.
 Natural History Research Div., Parks Canada.

An investigation into the Trans-Canada Highway as contributing to ungulate mortality. Briefly studies habitat and population distributions of elk, mule deer, white-tailed deer, and bighorn sheep.
 Subject: MF1 BE6 Area: B Source: KPWL

EL0086

Jebson, L. 1979.
 Elk damage to pasture and cropland in southwestern Alberta (interim report).
 Alta. Fish and Wildl. Edmonton, Alberta.

Paper discusses management techniques, and response of the elk to steps taken to reduce elk damage to pasture and cropland in southern Alberta. In addition, elk seasonal habitat utilization patterns, a history of the ranchers problems with elk, harassment techniques, and special hunting seasons are studied. Recommendations on the elk problem in this area are looked at, in light of the preliminary results.
 Subject: MA5 BE6 Area: A Source: AFWL

EL0100

Kuhn, J.A. and B. Martens. 1979.
 Coal mine development and elk biology : environmental impact assessment in Alberta and British Columbia. In North American elk : ecology, behavior and management., Boyce and Hayden-Wing, Eds.
 Univ. of Wyoming. Wyoming.

Looks at the impact of coal mining on elk in the Rocky Mountains of Alberta and British Columbia. Extensive description of methodology is given, as well as an outline of approaches to impact assessment.
 Subject: BE6 MA4 RT10 Area: A Source: CWSE

EL0105

Lovaas, A.L. 1970.
 People and the Gallatin elk herd.
 Montana Fish and Game Dept. Helena, Montana.

Discusses man's activities, and the effects they have on the Gallatin elk herd in Montana. Management considerations are included, given the problems man has inflicted on the herd.
 Subject: BE6 MA4 Area: B Source: CWSE

EL0108

Lyon, L.J. 1979.
 Habitat effectiveness for elk as influenced by roads and cover.
 J. Forestry 77(10):658-660.

Discusses habitat with respect to influence by roads and cover, on elk in western Montana.
 Subject: BE3 BE6 Area: C Source: KPWL

EL0002

Marcum, C.L. 1976.

Habitat selection and use during summer and fall months by a western Montana elk herd.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. 1976:91-96.

Annotation not available.

Subject: BE6 MA4 BE3

Area: B

Source: DIAL

EL0122

Morgantini, L.E. and R.J. Hudson. 1979.

Human disturbance and habitat selection in elk. In North American elk : ecology, behavior and management., Boyce and Hayden-Wing, Eds.
Univ. of Wyoming, Laramie.

Discusses how human disturbances such as traffic influenced habitat selection of elk on the Ya Ha Tinda Ranch in western Alberta.

Subject: BE3 BE6

Area: B

Source: CWSE

EL0242

Morgantini, L.E. and R.J. Hudson. 1985.

Changes in diets of wapiti during a hunting season.
J. Range Manage. 38(1):77-79.

This study was conducted to assess the impact of hunting on diets of wapiti (Cervus elaphus) population in west-central Alberta, Canada.

Subject: BE6 NP2

Area: B

Source: UOAL

EL0003

Perry, C. and R. Overly. 1976.

Impact of roads on big game distribution in portions of the Blue Mountains of Washington.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. 1976: 62-68.

Annotation not available.

Subject: BE6 MA4

Area: B

Source: DIAL

EL0004

Rost, G.R. and J.A. Bailey. 1979.

Distribution of mule deer and elk in relation to roads.
J. Wildl. Manage. 43(3):634-641.

The objective of this study was to assess the distribution of mule deer and elk (Cervus canadensis) in relation to roads on winter ranges in Colorado. The method used was fecal-pellet group counts.

Subject: BE6 MA4

Area: B

Source: UOAL

EL0155

Rost, G.R. and J.A. Bailey. 1979.

Responses of deer and elk to roads on the Roosevelt National Forest.

Discusses the behavioral responses of deer and elk to roads in the Roosevelt National Forest which interfere with their winter range. The method used was pellet group counts, and some discussion as to the accuracy of this method was included.

Subject: BE6 MA4 PD5

Area: B

Source: CWSE

EL0159

Schultz, R.D. and J.A. Bailey. 1978.

Responses of national park elk to human activity.
J. Wildl. Manage. 42(1):91-100.Outlines observations on the reactions of elk (*Cervus canadensis*) to human activity in Rocky Mountain National Park, Colorado. The two major types of human activity studied were traffic volume and tourist activity.

Subject: BE6

Area: B

Source: UABA

EL0160

Singer, F.J. 1975.

Behavior of mountain goats, elk and other wildlife in relation to U.S. Highway 2, Glacier National Park.
Federal Highway Admin. and Glacier National Park. West Glacier, Montana.

Examines various effects of the construction and use of U.S. Highway 2 where it traverses a winter range for elk and mule deer, and a movement route for mountain goats in Glacier National Park. Extensive management alternatives are included, as well as their advantages and disadvantages.

Subject: BE6 MA4

Area: B

Source: CWSE WNPL

EL0176

Stelfox, J.G. 1974.

Caribou - elk - human interrelationship study, Skyline Trail, Maligne Mountains, Jasper National Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Details a study done to determine the interrelationships of caribou, elk and human beings in Jasper National Park. Correlates distribution patterns for each species, and behavior patterns when any two species came in contact.

Subject: BE2 BE4 BE6

Area: B

Source: CWSE

EL0192

Tomm, H.O. 1978.

Response of wild ungulates to logging practises in Alberta.
MSc. Thesis, Univ. of Alberta. Edmonton, Alberta.

Assesses the impact of the effects of logging practises on wild ungulates (moose, deer and elk) in the west-central forests of Alberta. Analysis of variance was conducted to test the independent variables of geographic region, the effect of harassment, distance from cover and ungulate species. In addition, recommendations for management of timber, and wild ungulates are presented.

Subject: MA4 BE6

Area: A

Source: UAAS

EL0200

Ward, A.L. 1976.

Elk behavior in relation to timber harvest operations and traffic on the Medicine Bow Range in south-central Wyoming.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec. 1976:32-43.

Puts together data on elk behavior in relation to timber harvest and traffic

on the Medicine Bow Range, Wyoming. Methods used were radiotelemetry, time-lapse photography and counts of elk tracks on roads.
Subject: RT10 MA4 BE6 Area: B Source: AFWL

EL0201

Ward, A.L., Cupal Lea Oakley and Weeks. 1973.
Elk behavior in relation to cattle grazing, forest recreation, and traffic.
Trans. North Amer. Wildl. Conf. 38:327-337.

Investigates the alteration of elk behavior due to traffic, forest recreation and cattle grazing in the Medicine Bow north forest, Wyoming. Study period covered April 28 to October 8, 1971.
Subject: BE6 RA2 Area: B Source: UOAL

BIBLIOGRAPHIES AND WORKSHOP PROCEEDINGS (BW)

EL0094

Kirsch, J.B. and K.R. Greer. 1968.
Bibliography... wapiti-American elk and European Red deer.
Montana Fish and Game Dept., Special Report #2.

A bibliography indexed by author for wapiti - American elk and European Red deer all over the world. No annotations are included.
Subject: BW Area: B Source: CWSE

EL0136

Neiland, K. and C. Dukeminier. 1972.
A bibliography of the parasites, diseases and disorders of several important wild ruminants of the northern hemisphere.
Alaska Dept. Fish and Game, Game Technical Bull. #3.

Lists several publications and articles pertaining to the diseases and parasites, and physical disorders of wild ruminants in the northern hemisphere.
Subject: PD3 BW Area: B Source: ADRI

EL0161

Singleton, J. 1976.
Food habits of wild ungulates in British Columbia : bibliography and plant synopsis.
B.C. Fish and Wildl. Branch, Dept. Recreation and Travel Industry.

Describes food habits of moose, elk, deer, mountain goats and bighorn and thinhorn sheep in British Columbia. Included is a bibliography for each animal, as well as a plant synopsis for the habitat.
Subject: NP2 BW Area: B Source: CWSE

EL0217

Worley, D.E. and K.R. Greer. 1976.
Parasites and diseases of North American elk (Cervus spp.).
Montana Fish and Game Dept. Montana.

An annotated bibliography for the diseases and parasites of North American elk (Cervus spp.). The references are arranged alphabetically, by author.
Subject: BW PD3 Area: B Source: ADRI

MANAGEMENT - GENERAL (MA1)

EL0007

Anderson, C.C. 1958.

The elk of Jackson Hole. A review of Jackson Hole elk studies.
Wyoming Game and Fish Comm., Bull. #10.

This report outlines specific problems confronting management of elk in the Jackson Hole area, and summarizes the possible solutions which have been recommended. The various topics discussed are early history, population trends, summer and winter feeding and distribution, hunting, sex ratios, and productivity of the elk herd in Wyoming.

Subject: MA1 MA3

Area: B

Source: CWSE

EL0010

Anonymous. 1979.

Proposed wildlife management plan for British Columbia.
Dept. Conservation, Ministry of Environment. Victoria, B.C.

Outlines a management plan for wildlife in British Columbia. Discusses management philosophy, problems and policy, and implementation of the plan. Included is a short report on various species, which outlines their specific problems.

Subject: MA1

Area: B

Source: WNPL

EL0233

Anonymous. 1976.

Problem wildlife management.

Wildl. Manage. Series #9, Fish and Wildl. Div., Alta. Lands and
Forests. Edmonton, Alberta.

Describes a program set up to resolve wildlife conflicts through damage prevention, property protection, damage compensation and population density and distribution control.

Subject: MA1 MA5

Area: A

Source: ARPL

EL0012

Bartels, R. and R. Denney. 1969.

Analysis of factors contributing toward declining elk populations in the Chesnimus Unit.

Game Div., Special Report. Wallowa District, Oregon.

Report examines various factors which could be contributing to the declining elk population in the Chesnimus Unit. The factors discussed include population, production, elk management, disease, predation, range conditions, and harassment. Recommendations are included after the discussion of causes.

Subject: PD1 MA1

Area: B

Source: CWSE

EL0020

Boyce, M.S. and L.D. Hayden-Wing Eds. 1979.
 North American elk : ecology, behavior and management.
 Univ. of Wyoming. Laramie, Wyoming.

An extensive collection of articles dealing with population biology, habitat ecology, behavior, pathology and nutrition, and management of elk in North America.

Subject: RA1 BE1 PD1 MA1 Area: B Source: CWSE

EL0021

Boyd, R.J. 1980.
 American elk. In Big game of North America, ecology and management.,
 Schmidt and Gilbert, Eds.
 Stackpole Books. Harrisburg, Pennsylvania.

General description of American elk : their distribution, physical characteristics, life history, population dynamics, habitat, and management. A good overview on the life of wapiti in North America.

Subject: PD1 BE3 MA1 Area: B Source: AFWL

EL0021

Canada., Parks 1978.
 Waterton Lakes National Park resource conservation report.
 Wardens Office, Parks Canada, unpub. Waterton Lakes National Park, Alberta.

Gives management recommendations for each year according to land, vegetation, wildlife, and other general areas. A good summary overview of annual management concerns.

Subject: MA1 Area: A Source: WNPL

EL0043

DeByle, N.V. 1979.
 Potential effects of stable versus fluctuating elk populations in the alpen ecosystem. In North American elk, ecology and management. p. 13-19.
 Univ. Wyoming. Laramie, Wyoming.

Discusses management techniques with respect to normal population fluctuations of elk. The study area was the Gros Ventre drainage, Wyoming.

Subject: MA1 RA1 Area: B Source: KPWL

EL0020

Golley, F.B. and H.K. Buechner. 1968.
 A practical guide to the study of productivity of large herbivores.
 Blackwell Scientific Pub., International Biological Programme Handbook #7.
 Edinburgh.

Technical guidebook to the study of productivity in large mammals including both domesticated and undomesticated animals. Pertinent to agricultural range management, wildlife management, physiological, veterinary and ecological disciplines.

Subject: NP3 MA1 Area: B Source: UOAL

EL0127

Murie, O.J. 1951.

The elk of North America.
Wildl. Manage. Inst. Washington, D.C.

Very detailed book which discusses many aspects of elk in North America. Topics covered are : history, habitat, migration, physical characteristics, reproduction, mortality factors, diseases and parasites, food habits, population dynamics and management.

Subject: PD1 BE1 MF1 MA1 Area: B Source: CWSE WNPL

EL0157

Schmidt, J.L. and eds. D.L. Gilbert 1980.

Big game of North America, ecology and management.
Stackpole Books. Harrisburg, Pennsylvania.

A good reference on the ecology and management of the big game of North America. Includes short articles on various animals, and concludes with a series of reports dealing specifically with habitat and management problems.

Subject: BE1 MA1 RA1 PD1 Area: B Source: AFWL AFWE

EL0179

Stelfox, J.G. and R.D. Taber. 1969.

Big game in the northern Rocky Mountain coniferous forest.
Univ. of Montana Foundation. Missoula, Montana.

Coniferous Forests of the Northern Rocky Mountains : Proceedings of the 1968 Symp.:197-222.

Discusses range vegetation, seasonal distributions and management techniques for big game (wapiti, deer, moose, caribou, bison, mountain goats and bighorn sheep) in the coniferous forests of the northern Rocky Mountains.

Subject: BE1 BE2 MA1 Area: B Source: CWSE

EL0187

Telfer, E.S. 1977.

Impact on wildlife of land management alternatives for the Alberta east slopes.
Can. Wildl. Serv. Edmonton, Alberta.

Discusses the impact on wildlife of five land management alternatives : 1) Uncut virgin forest, 2) Optimum snowpack management, 3) Two-stage stand removal, 4) Continuous clearcutting, and 5) Optimum cutting for wildlife. The paper deals with the East slopes and foothills of the Rocky Mountains, Alberta.

Subject: MA1 MA4 Area: A Source: AFWL

EL0189

Thomas, J.W. and D.E. Towell. 1982.

Elk of North America, ecology and management.
Stackpole Books. Harrisburg, Pennsylvania.

A collection of articles dealing primarily with the ecology and management of the elk of North America. Some specific topics are : classification and distribution, physiology, diseases and parasites, behavior, habitat and food preferences, land and elk management, and recreational use of elk. Very detailed analysis of the subject matter.

Subject: PD1 BE1 MA1 Area: B Source: AFWL

HABITAT MANAGEMENT (MA2)

EL0008

- Anderson, E.W. and R.J. Scherzinger. 1975.
Improving quality of winter forage for elk by cattle grazing.
J. Range Manage. 28(2):120-125.

Discusses the results of a resource management plan which was put into effect in 1964 and involved various range improvements, and a cattle grazing system designed to increase forage quality for wintering Rocky Mountain elk. The study was carried out on the Bridge Creek Wildlife Management Area in northeastern Oregon.
Subject: MA2 RA7 Area: B Source: AFWL

EL0011

- Barmore, W.J., Jr. 1965.
Aspen - elk relationships on the northern Yellowstone winter range. Yellowstone National Park, Wyoming.
Western Assoc. Fish and Game Comm. Elk Workshop, Bozeman, Montana. March 2-4, 1965.

Discusses the problem of overgrazing on aspen by elk in Yellowstone National Park. Looks at management techniques which might restore the balance between elk and aspen.
Subject: RA4 MA2 MA3 Area: B Source: CWSE

EL0014

- Berg, B.P. 1983.
Wild and domestic ungulate interactions in the Bob Creek Area, southwestern Alberta.
MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Examines the interactions, patterns, differences and implications of management of resource interactions of elk (*Cervus elaphus nelsoni*), mule deer and cattle in the area around Bob Creek, southwestern Alberta. The types of resource use discussed are: seasonal use, spatial and topographical use, the use of plant communities, diets, environmental selection, and activity and range use. A discussion follows dealing with the resource division among the ungulates. Details of methods used, and management suggestions for grazing are included.
Subject: RA2 BE3 MA2 Area: A Source: LARS

EL0196

- Camp, J. and Van E.S. Telfer. 1974.
Browse yield and use by ungulates in Elk Island National Park, 1973-1974.
Can. Wildl. Serv. Edmonton, Alberta.

This report presents the results of a remeasurement of transects established at Elk Island National Park in 1972 to monitor the trend of the yield and utilization of woody browse. Also discusses management procedures for range and ungulates, to deal with problems discovered during the study.
Subject: RA4 RA5 MA2 Area: B Source: WNPL

EL0222

Campbell, J.B. et al. 1962.

Range management of grasslands and adjacent parklands in the Prairie provinces.
Dept. Agric. Ottawa, Ontario.

Looks at land usage, and crop production of grazing land in grasslands and adjacent parklands in Alberta and Saskatchewan. Major management issues are discussed as well.

Subject: RA1 MA2

Area: B

Source: UOAL

EL0219

Clark, S.E., J.A. Campbell and J.B. Campbell. 1942.

An ecological and grazing capacity study of the native grass pastures in southern Alberta, Saskatchewan and Manitoba.

Technical Bull. #44, Dept. Agriculture. Ottawa, Ontario.

Discusses land usage, crop production and grazing lands, research and environmental monitoring, and carrying capacity of rangelands in southern Alberta, Saskatchewan and Manitoba, Canada. Grasslands management and other major management issues are also discussed.

Subject: RA1 MA2

Area: A

Source: UOCL

EL0044

Demarchi, D.A. 1971.

Ecology of big game winter ranges in the southern Rocky Mountain Trench, East Kootenay region.

Wildl. Manage. Div., B.C. Fish and Wildl. Branch. Victoria, British Columbia.

Describes in detail the condition, utilization, quality, and floral phenology of the big game winter ranges in the East Kootenay region of British Columbia. Includes a discussion of the effects of the flooding of the Libby Reservoir, and possible livestock reductions in that area.

Subject: RA4 RA5 RA6 MA2

Area: A

Source: CWSE

EL0050

Flook, D.R. 1955.

An appraisal of the elk situation in the Athabasca Valley of Jasper Park.

Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Describes the elk range vegetation in the Athabasca Valley, Jasper Park, Alberta. Management recommendations are then outlined in view of the overcrowded and generally poor range conditions.

Subject: RA5 MA2

Area: B

Source: CWSE

EL0051

Flook, D.R. 1956.

Range conditions and livestock grazing, Riding Mountain National Park.

Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines range conditions, livestock grazing, and the effect of these on wildlife in Riding Mountain National Park.

Subject: RA2 RA5 MA2

Area: B

Source: CWSE

EL0049

Flook, D.R. 1955.
Appraisal of the elk situation, Waterton Lakes National Park, October, 1955.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines the winter range conditions of the three herds of elk within Waterton Lakes National Park, Alberta. Gives details of the numbers of elk spotted during the study, and plant composition of the range. Management objectives are included.

Subject: RA4 RA5 MA2 Area: A Source: CWSE

EL0081

Hudson, R.J. 1972.
Integrated use of grazing resources.
Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29, 1972:21-31.

Discusses factors influencing the interactions of domestic and wild ungulates, and how to organize management procedures which would reduce the competition among animals, in light of these factors.

Subject: MA2 RA2 BE3 BE4 Area: B Source: LARS

EL0088

Jones, W.B. 1965.
Response of major plant species to elk and cattle grazing in northwestern Wyoming.
J. Range Manage. 18(4):218-220.

Studied the difference between elk range, cattle range, and ungrazed range in northwestern Wyoming.

Subject: RA2 MA2 BE3 Area: B Source: UABA

EL0098

Knowles, C.J. and R.B. Campbell. 1981.
Distribution of elk and cattle in a rest-rotation grazing system.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:47-60.

Discusses the distributional relationships of elk and cattle in a rest-rotation grazing system in the Missouri River breaks of north-central Montana. The study was conducted in the period from 1973 to 1976.

Subject: BE4 RA4 MA2 BE2 Area: B Source: AFWL

EL0101

Leege, T.A. and W.O. Hickey. 1967.
Loscha elk study.
Idaho Fish and Game Project W85-R-18, Job #8. Idaho.

Studies the management technique of spring burning, and compares it to fall burning for range rehabilitation. A Pete King range study was also documented which determined what range is used by elk under different snow and weather conditions during winter months. The study was conducted along the Loscha River, Idaho.

Subject: MA2 RA7 Area: B Source: WNPL

EL0102

Leege, T.A., M.W. Schlegel and T.J. Hershey. 1976.
 Elk ecology.
 Idaho Dept. of Fish and Game, Project W-160-R-3. Idaho.

This project is divided into nine separate studies : Range rehabilitation, spring vs fall burning for range, ecological study, population dynamics and movements of the Loscha elk herd, immobilizing equipment and new drugs, range improvement through vegetal manipulation, elk research projects, and description of habitat needs of elk during different seasons. The study area is along the slopes of Fish Creek in the Loscha River drainage, Idaho.
 Subject: MA2 BE3 RA3 Area: B Source: CWSE

EL0106

Lyon, L.J. 1966.
 Problems of habitat management for deer and elk in the northern forests.
 U.S. Forest Serv. Research Paper INT-24. Ogden, Utah.

This paper describes problems of habitat management that are characteristic of the northern Rocky Mountain country, and proposes research projects that could help solve them.
 Subject: MA2 Area: B Source: CWSE

EL0133

McLaughlin, J.S. 1965.
 1965-66 elk and habitat management for Yellowstone National Park.
 Yellowstone National Park. Wyoming.

Discusses elk range restoration, herd transplanting, and harvesting by hunters as methods which would lead to a balanced relationship between plants and animals and between different species of animals in Yellowstone National Park, Wyoming.
 Subject: MA2 MA3 Area: B Source: CWSE

EL0141

Oldemeyer, J.L., V.H. Reid and D.A. Nickey. 1981.
 Evaluation of rest-rotation grazing in the Missouri River breaks on the Charles M. Russell National Wildlife Refuge, Montana.
 Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene. Idaho. April 20-22, 1981:32-46.

Documents a study done to evaluate the vegetative differences between three grazing treatments after twelve years in a four year rest-rotation grazing system for cattle in the Missouri River breaks, Montana.
 Subject: MA2 RA5 Area: B Source: AFWL

EL0142

Orme, M.L. and D.P. Ragain. 1981.
 Livestock and big game summer forage following logging in north Idaho.
 Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:607-614.

Documents the results of a study conducted to analyze summer forage in early successional stages of reforestation on the Avery Ranger District, Idaho Panhandle National Forests. Gives quantitative data on available forage produced in six habitat types within the region. Discussion on the use of

this forage for livestock and/or big game animals is included.
 Subject: MA2 MA4 RA7 Area: B Source: AFWL

EL0154

Roberts, H.B. and K.G. Becker. 1981.
 Managing central Idaho rangelands for livestock and elk.
 Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
 20-22, 1981:537-543.

Discusses summer habitat conditions for elk in central Idaho. Looks at
 competition for forage and space with grazing livestock in that area.
 Recommendations for management are included.
 Subject: RA2 RA5 MA2 Area: B Source: AFWL

EL0156

Schallenberger, A.
 The Sun River Game Preserve.
 Montana Outdoors.

Gives a general description of elk and bighorn sheep competition, elk hunting,
 and management procedures for elk on the Sun River Game Preserve,
 Montana.
 Subject: RA2 MF2 MA2 Area: B Source: CWSE

EL0162

Skovlin, J.M., P.J. Edgerton and R.W. Harris. 1968.
 The influence of cattle management on deer and elk.
 23'rd North Amer. Wildl. Conf, March 11-13, 1968:169-181.

Studies the relationship between big game and cattle range usage in the Blue
 Mountains of Oregon and Washington. Looks into the reasons behind the
 differing yearly and seasonal use. Methods used are outlined in detail.
 Subject: MA2 RA2 RT3 BE3 Area: B Source: LARS UOAL

EL0164

Smith, A.D. and D.D. Doell. 1968.
 Guides to allocating forage between cattle and big game on big game winter
 range.
 Pub. #68-11, Utah State Div. Fish and Game.

Looks at range utilization during different seasons, and big game-cattle forage
 competition in Utah. Determines seasonal, and the intensity of, range use by
 cattle which minimizes grazing on woody plants and still allows full utilization
 of the herbaceous species.
 Subject: RA3 RA2 MA2 Area: B Source: LARS

EL0195

Urness, P.J. 1981.
 Livestock as tools for managing big game winter range in the intermountain
 west.
 Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
 20-22, 1981:20-31.

Investigates the positive aspects of wild and domestic ungulate interactions.
 Focuses specifically on the use of livestock for managing big game winter

ranges. Outlines studies done using cattle, sheep and horses on ungulate winter range.

Subject: RA2 MA2

Area: B

Source: AFWL AFWE

EL0227

Weatherwill, R.G. and L.B. Keith. 1969.

The effects of livestock grazing on an aspen forest community.

Fish and Wildl. Div., Alta. Dept. Lands and Forests. Edmonton, Alberta.

Discusses how livestock grazing effects aspen forest communities with respect to land usage, crop production, and flora and fauna.

Subject: RA4 MA2

Area: B

Source: UOCL

POPULATION MANAGEMENT (MA3)

EL0007

Anderson, C.C. 1958.

The elk of Jackson Hole. A review of Jackson Hole elk studies. Wyoming Game and Fish Comm., Bull. #10.

This report outlines specific problems confronting management of elk in the Jackson Hole area, and summarizes the possible solutions which have been recommended. The various topics discussed are early history, population trends, summer and winter feeding and distribution, hunting, sex ratios, and productivity of the elk herd in Wyoming.

Subject: MA1 MA3

Area: B

Source: CWSE

EL0011

Barmore, W.J., Jr. 1965.

Aspen - elk relationships on the northern Yellowstone winter range. Yellowstone National Park, Wyoming.

Western Assoc. Fish and Game Comm. Elk Workshop, Bozeman, Montana. March 2-4, 1965.

Discusses the problem of overgrazing on aspen by elk in Yellowstone National Park. Looks at management techniques which might restore the balance between elk and aspen.

Subject: RA4 MA2 MA3

Area: B

Source: CWSE

EL0237

Boyd, R.J. 1972.

White River elk experimental management study.

Colorado Div. Wildl. Denver, Colorado.

This annual report summarizes the effect of a spike bull protection regulation in 1971 upon an intensively managed elk herd.

Subject: MA3

Area: B

Source: DIAL

EL0032

Cole, G.F. 1969.
Elk and the Yellowstone ecosystem.
Yellowstone National Park.

Discusses man's influence on elk and their habitat in Yellowstone National Park. Some historical and present aspects of herd population dynamics are outlined. Management objectives are discussed in light of the problem.
Subject: MA3 PD1 Area: B Source: CWSE

EL0041

Craighead, J.J. 1952.
A biological and economic appraisal of the Jackson Hole elk herd.
New York Zool. Soc. and Conservation Found. New York, U.S.A.

Outlines past and present population dynamics of the Jackson Hole elk herd in Wyoming. Management techniques, especially winter range improvement and artificial feeding of elk are discussed with respect to declining numbers.
Subject: PD2 MA3 Area: B Source: CWSE

EL0046

Eastman, D.S. 1972.
Current knowledge of ungulate competition in southern British Columbia.
Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29, 1972:40-51.

Discusses wild-domestic ungulate competition in various regions of southern British Columbia. Gives a list of measurements which must be obtained in order to determine the level of competition. Management suggestions are made to lessen this level of competition.
Subject: RA2 BE4 MA3 Area: B Source: LARS

EL0067

Greer, K.R., Jr. and W.W. Hawkins J.E. Catlin. 1968.
Experimental studies of controlled reproduction in elk (wapiti).
J. Wildl. Manage. 32(2):368-376.

Describes a study on controlled reproduction in elk, as a technique designed to decrease overpopulated areas of elk. Various methods were used.
Subject: PD4 MA3 Area: B Source: UOAL

EL0069

Gross, J.E. 1969.
Optimum yield in deer and elk populations.
34th North Amer. Wildl. and Nat. Resources Conf., Washington, D.C. March 5, 1969.

Discusses how knowledge of population dynamics can be related to practical application in the field of game management. Describes how fecundity - rate changes can give yield curves which can be used for maintaining a balance between deer and elk, and their food supply.
Subject: PD4 MA3 Area: B Source: CWSE

EL0240

Jantzen, R.A. 1961.

Elk management information.
 Arizona Game and Fish Dept. Arizona.

Gives a twenty-five year summary of harvest statistics of elk on the Gila River Basin, Arizona.

Subject: MA3 MF2 Area: B Source: DIAL

EL0133

McLaughlin, J.S. 1965.

1965-66 elk and habitat management for Yellowstone National Park.
 Yellowstone National Park. Wyoming.

Discusses elk range restoration, herd transplanting, and harvesting by hunters as methods which would lead to a balanced relationship between plants and animals and between different species of animals in Yellowstone National Park, Wyoming.

Subject: MA2 MA3 Area: B Source: CWSE

EL0172

Stelfox, J.G. 1966.

Deer and elk population, harvests, range conditions and proposed 1966 seasons.
 Alta. Fish and Wildl. Div. Edmonton, Alberta.

Documents the populations, species, age and sex composition of the 1965 harvest for elk and deer in northwestern Alberta. Proposes the 1966 harvest season.

Subject: PD5 MF2 MA3 Area: B Source: CWSE AFWE

RESOURCE DEVELOPMENT CONFLICTS (MA4)

EL0006

Allen, E.O. 1971.

Elk - logging relationships in the northern Rocky Mountains.
 Montana Fish and Game Dept., Proj. W-120-R. Bozeman, Montana.

Discusses the impact of logging on the natural habitat of the elk in the northern Rocky Mountains. Suggestions for management to balance out the problem are included.

Subject: MA4 Area: B Source: CWSE

EL0223

Anonymous. 1979.

The environmental effects of forestry operations in Alberta : report and recommendations.

Environ. Council of Canada. Edmonton, Alberta.

Provides a good overview of Alberta Governments forest policies and of the

past and present (1979) importance of Alberta's forest lands.... Topics relate to common concerns related to resource development and environmental protection.

Subject: MA4

Area: A Source: ARPL

EL0016

Black, H., R.J. Scherzinger and J.W. Thomas. 1975.
Relationships of Rocky Mountain elk and Rocky Mountain mule deer habitat to timber management in the Blue Mountains of Oregon and Washington.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec. 16-17, 1975: 11-31.

Discusses the consequences of timber management decisions on potential for deer and elk use, by land type. Makes recommendations which will help in optimizing elk habitat in areas subject to roading and timber management.

Subject: RA4 MA4

Area: B Source: AFWL

EL0247

Boltz, M.J. 1979.
Impacts of prescribed burns and clearcuts upon summer elk food habits, diet quality, and distribution in central Washington.
M.Sc. Thesis, Washington State Univ.

Evaluated impacts of prescribed burns on elk distributions, food habits and diet quality in upper Naneum Creek, Kittitas County, Washington. Seasonal trend in elk habitat use were related to phenology and utilization-induced habitat changes.

Subject: BE6 RA7 MA4 NP2

Area: B Source: UOAL

EL0231

Douglas, G.W., J.A.S. Nagy and G.W. Scotter. 1975.
Effects of human and horse trampling on natural vegetation, Waterton Lakes National Park.
Can. Wildl. Serv. Calgary, Alberta.

In 1973, a three-year project to assess various intensities of human and horse traffic impact at different intervals during the growing season and on various undisturbed vegetation communities in Waterton Lakes National Park was undertaken. This report details the results of the 1973 field work.

Subject: MA4 RT10

Area: A Source: WNPL

EL0093

Kirsch, J.B. 1962.
Range use, relationship to logging, and food habits of the elk in the Little Belt Mountains, Montana.
MSc. Thesis, Montana State College. Bozeman, Montana.

Investigates distribution, movement, range use, food habits, and the relationships to block clear cut logging of lodgepole pine of elk in the Little Belt Mountains in Montana. Relates elk movements and range use to broadly designated plant communities, and correlates size, age, and moisture conditions of the pine clear cuts with elk usage. Outlines a vegetational analysis of two clear cuts and the uncut lodgepole to compare changes resulting from logging.

Subject: BE3 RA4 MA4

Area: C Source: CWSE

EL0100

Kuhn, J.A. and B. Martens. 1979.
Coal mine development and elk biology : environmental impact assessment in Alberta and British Columbia. In North American elk : ecology, behavior and management., Boyce and Hayden-Wing, Eds.
Univ. of Wyoming. Wyoming.

Looks at the impact of coal mining on elk in the Rocky Mountains of Alberta and British Columbia. Extensive description of methodology is given, as well as an outline of approaches to impact assessment.
Subject: BE6 MA4 RT10 Area: A Source: CWSE

EL0105

Lovaas, A.L. 1970.
People and the Gallatin elk herd.
Montana Fish and Game Dept. Helena, Montana.

Discusses man's activities, and the effects they have on the Gallatin elk herd in Montana. Management considerations are included, given the problems man has inflicted on the herd.
Subject: BE6 MA4 Area: B Source: CWSE

EL0107

Lyon, L.J. 1976.
Elk use as related to characteristics of clearcuts in western Montana.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec., 1976:69-72.

Investigates clearcuts of various sizes and locations on elk summer ranges in western Montana, to determine amount of elk usage using pellet group counts. Includes a table of various independent variables associated with the clearcut openings (i.e. cover quality of adjacent forage, nearest vehicle access, and so on.).
Subject: RA7 MA4 Area: B Source: AFWL

EL0109

Lyon, L.J. and C.E. Jensen. 1980.
Management implications of elk and deer use of clear-cuts in Montana.
J. Wildl. Manage. 44(2):352-362.

Discusses a study investigating the use of clear-cuts by elk (*Cervus elaphus nelsoni*), mule deer and white-tailed deer in Montana. Reasons for various usage patterns are outlined, as well as the methods used to discover these.
Subject: RA4 MA4 Area: B Source: LARS

EL0002

Marcum, C.L. 1976.
Habitat selection and use during summer and fall months by a western Montana elk herd.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. 1976:91-96.

Annotation not available.
Subject: BE6 MA4 BE3 Area: B Source: DIAL

EL0123

Morris, M.S. 1956.
Elk and livestock competition.
J. Range Manage. 9(1):10 ff.

Discusses food and range requirements of elk and livestock, economic aspects of the problem of elk and livestock competition, and various elk management considerations for Montana. The general distributions of the animals are included.

Subject: BE4 RA2 MA4

Area: B Source: CWSE

EL0142

Orme, M.L. and D.P. Ragain. 1981.
Livestock and big game summer forage following logging in north Idaho.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
20-22, 1981:607-614.

Documents the results of a study conducted to analyze summer forage in early successional stages of reforestation on the Avery Ranger District, Idaho Panhandle National Forests. Gives quantitative data on available forage produced in six habitat types within the region. Discussion on the use of this forage for livestock and/or big game animals is included.

Subject: MA2 MA4 RA7

Area: B Source: AFWL

EL0003

Perry, C. and R. Overly. 1976.
Impact of roads on big game distribution in portions of the Blue Mountains of Washington.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. 1976: 62-68.

Annotation not available.

Subject: BE6 MA4

Area: B Source: DIAL

EL0148

Ream, B., B. Beall and L. Marcum. 1971.
Sapphire Range elk ecology study - elk, logging and people.
School of Forestry, Univ. of Montana. Montana.

Outlines a study of elk on the Sapphire range, Montana. Main topics include capture and marking of elk, and their habitat use and food preferences. Some information on logging, and the effects of that on the range is given.

Subject: BE3 MA4 NP2

Area: B Source: CWSE

EL0243

Redgate, R.M. 1978.
Behavioural and ecological considerations in the management of elk in Camp 1, Athabasca Valley, Alberta.
M.E.Des. Thesis, Univ. of Calgary. Calgary, Alberta.

Outlines a study of the behavior and ecology of Rocky Mountain elk (*Cervus elaphus nelsoni*) during the summers of 1976 and 1977 between Jasper and Hinton, Alberta. The objectives of the project were to gain insights into the adaptive strategies of elk, to examine the impact of clearcut logging on elk, and to develop a management programme for elk.

Subject: MA4 BE1

Area: B Source: UOCL CWSE

EL0004

- Rost, G.R. and J.A. Bailey. 1979.
Distribution of mule deer and elk in relation to roads.
J. Wildl. Manage. 43(3):634-641.

The objective of this study was to assess the distribution of mule deer and elk (*Cervus canadensis*) in relation to roads on winter ranges in Colorado. The method used was fecal-pellet group counts.
Subject: BE6 MA4 Area: B Source: UOAL

EL0155

- Rost, G.R. and J.A. Bailey. 1979.
Responses of deer and elk to roads on the Roosevelt National Forest.

Discusses the behavioral responses of deer and elk to roads in the Roosevelt National Forest which interfere with their winter range. The method used was pellet group counts, and some discussion as to the accuracy of this method was included.
Subject: BE6 MA4 PD5 Area: B Source: CWSE

EL0160

- Singer, F.J. 1975.
Behavior of mountain goats, elk and other wildlife in relation to U.S. Highway 2, Glacier National Park.
Federal Highway Admin. and Glacier National Park. West Glacier, Montana.

Examines various effects of the construction and use of U.S. Highway 2 where it traverses a winter range for elk and mule deer, and a movement route for mountain goats in Glacier National Park. Extensive management alternatives are included, as well as their advantages and disadvantages.
Subject: BE6 MA4 Area: B Source: CWSE WNPL

EL0169

- Stelfox, J.G. 1961.
Effects of harvesting coniferous forests in western Alberta on big game.
Alta. Fish and Wildl. Edmonton, Alberta.

This paper deals with a study on plant species, numbers, canopy coverage, browse forage fields and heights, utilization, seasonal big game numbers and distribution in a mature white spruce forest and during the first five plant successional years. Logged over areas that have been scarified are compared to unscarified areas. Study area is located near Hinton, Alberta. Relates how harvesting coniferous forests effect big game.
Subject: RA4 BE2 MA4 Area: B Source: CWSE

EL0175

- Stelfox, J.G. 1972.
Elements of controversy concerning resource exploitation on the welfare of native North American ungulate populations.
Can. Wildl. Serv. Edmonton, Alberta.

Discusses the effects of man's activities (i.e. logging, livestock grazing, roads, railways, mining, dams, resource development and military training) on ungulates in North America. The ungulates studied are deer, elk and moose.
Subject: MA4 Area: C Source: CWSE

EL0187

Telfer, E.S. 1977.

Impact on wildlife of land management alternatives for the Alberta east slopes.
Can. Wildl. Serv. Edmonton, Alberta.

Discusses the impact on wildlife of five land management alternatives : 1) Uncut virgin forest, 2) Optimum snowpack management, 3) Two-stage stand removal, 4) Continuous clearcutting, and 5) Optimum cutting for wildlife. The paper deals with the East slopes and foothills of the Rocky Mountains, Alberta.

Subject: MA1 MA4

Area: A Source: AFWL

EL0192

Tormm, H.O. 1978.

Response of wild ungulates to logging practises in Alberta.
MSc. Thesis, Univ. of Alberta. Edmonton, Alberta.

Assesses the impact of the effects of logging practises on wild ungulates (moose, deer and elk) in the west-central forests of Alberta. Analysis of variance was conducted to test the independent variables of geographic region, the effect of harassment, distance from cover and ungulate species. In addition, recommendations for management of timber, and wild ungulates are presented.

Subject: MA4 BE6

Area: A Source: UAAS

EL0200

Ward, A.L. 1976.

Elk behavior in relation to timber harvest operations and traffic on the Medicine Bow Range in south-central Wyoming.

Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec. 1976:32-43.

Puts together data on elk behavior in relation to timber harvest and traffic on the Medicine Bow Range, Wyoming. Methods used were radiotelemetry, time-lapse photography and counts of elk tracks on roads.

Subject: RT10 MA4 BE6

Area: B Source: AFWL

ELK-AGRICULTURAL INTERACTIONS (MA5)

EL0233

Anonymous. 1976.

Problem wildlife management.

Wildl. Manage. Series #9, Fish and Wildl. Div., Alta. Lands and Forests. Edmonton, Alberta.

Describes a program set up to resolve wildlife conflicts through damage prevention, property protection, damage compensation and population density and distribution control.

Subject: MA1 MA5

Area: A Source: ARPL

Anonymous. 1978.

EL0194

Elk damage to pasture cropland in southwestern Alberta.
Twin Butte Elk Management Committee.

Investigates the problem of elk damage to pasture and cropland in southwestern Alberta, and the possible solutions to the problem.
Subject: MA5 Area: A Source: AFWL

Bruns, E. 1973.

EL0025

Preliminary brief on ungulate depredation study in Region 1.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Investigates ungulate damage (elk, mule deer, white-tailed deer and pronghorn antelope) to agricultural crops in Region 1 (the Pincher Creek-Claresholm area).
Subject: MA5 Area: A Source: AFWL

Carruthers, D. 1973.

EL0029

An evaluation of elk depredation problems in the Highwood area.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Objectives were to discover the past and present extent and location of elk depredation in the Highwood area, Alberta, and to suggest procedures to reduce the level of damage.
Subject: MA5 Area: B Source: AFWL

Gunson, J.R., M.W. Barrett R.J. Lyons B.V. Sigurdson R.B. Toney and M. Winkler. 1980.

EL0071

Management plan for ungulate depredations in Alberta.
Problem Wildl. Comm., Alta. Agriculture. Lethbridge, Alberta.

Gives a list of management programs which would ease the impact of ungulate depredations in Alberta.
Subject: MA5 Area: B Source: AFWL

Jebson, L. 1979.

EL0086

Elk damage to pasture and cropland in southwestern Alberta (interim report).
Alta. Fish and Wildl. Edmonton, Alberta.

Paper discusses management techniques, and response of the elk to steps taken to reduce elk damage to pasture and cropland in southern Alberta. In addition, elk seasonal habitat utilization patterns, a history of the ranchers problems with elk, harrassment techniques, and special hunting seasons are studied. Recommendations on the elk problem in this area are looked at, in light of the preliminary results.
Subject: MA5 BE6 Area: A Source: AFWL

EL0111

Mack, T. and M. Howarth. 1983.
Twin Butte survey, Feb. 1983.

Alta. Energy and Natural Resources, Fish and Wildl. Div. Lethbridge, Alberta.

Documents the results of a survey of landowners around the Twin Butte and Waterton Lakes National Park areas. The survey discovered the damage that ungulate and bear populations are causing, as well as the attitudes of the landowners to the new elk draw in F300 and the spring grizzly hunt. Also makes suggestions for controlling ungulate damage on ranchland.

Subject: MA5 MF2 Area: A Source: AFWL

EL0139

Norstrom, W. 1974.

A survey of ungulate depredation on agricultural crops in southern Alberta.

Alta. Dept. Land and Forests, Fish and Wildl. Div. Lethbridge, Alta.

Paper discusses a survey of ungulate damage to agricultural crops in southern Alberta. Recommends a government-rancher, cost-sharing, panel-fence program as a management technique to reduce the damage.

Subject: MA5 Area: A Source: AFWL AFWE

EL0208

Weisser, D.K. 1975.

Ungulate management - problem wildlife. Stack fencing to prevent depredation by elk and deer, Aug. 1, 1975 to Dec. 8, 1975.

Problem Wildl. Div. Lethbridge, Alberta.

Discusses a method of stack fencing to prevent depredation by elk and deer in southern Alberta (Pincher Creek and Medicine Hat). Included are descriptions of construction, maintenance and cost of the fencing.

Subject: MA5 Area: B Source: AFWL

INTEGRATED RESOURCE MANAGEMENT (MA6)

EL0226

Anonymous. 1973.

Land use planning for conservation.

Wildl. Manage. Series, No. 6, Fish and Wildl. Div., Alta. Dept. Lands and Forests. Edmonton, Alberta.

Briefly discusses a 3 zone 'multiple use' approach to land allocation undertaken by the Alberta government in 1978, and the goals of the Fish and Wildlife Division's habitat management program in relation to this approach. The study areas are all located in Alberta.

Subject: MA6 RA1 Area: A Source: UOCL

EL0225

Geist, D.A. 1975.

Risk zoning : a recreation management system and method of measuring carrying capacity.

J. Forestry 73(11):711-714.

Studies the carrying capacity of land in western Canada and the U.S. Relates the land usage to recreation and developments. Discusses major management issues dealing with this, as well.

Subject: RA4 MA6

Area: A

Source: UOAL

EL0224

Wallis, C. 1980.

Montane, foothills parkland and southwest rivers : natural landscapes survey 1978-79.

Parks Div., Resource Assessment and Management Section. Edmonton, Alberta.

Documents data collected on land use, fauna, flora and landscape characteristics. Previously studied sites and the new study areas were compared from floristic, faunal, geological and landscape viewpoints and ecological values. The study area is the montane and foothills parkland sections of the Rocky Mountain Natural Region from Longview south to the U.S. border.

Subject: RA1 PD1 MA6

Area: A

Source: ARPL

MORTALITY FACTORS (MF1)

EL0064

Green, H.U. 1946.
The elk of Banff National Park.
The National Parks Serv. Ottawa, Canada.

Discusses population dynamics, distribution, general behavior and various mortality factors of elk in Banff National Park. Included in mortality factors are predators, diseases and parasites.

Subject: PD2 MF1

Area: B

Source: KPWL

EL0076

Harrison, G., R. Hooper and P. Jacobson. 1982.
Ungulate population statistics and habitat analysis.
Natural History Research Div., Parks Canada.

An investigation into the Trans-Canada Highway as contributing to ungulate mortality. Briefly studies habitat and population distributions of elk, mule deer, white-tailed deer, and bighorn sheep.

Subject: MF1 BE6

Area: B

Source: KPWL

EL0228

Holroyd, G.L. 1979.
The impact of highway and railroad mortality on the ungulate populations in the Bow Valley, Banff National Park.
Can. Wildl. Serv. Edmonton, Alberta.

Discussion concentrates on the unnatural mortality of elk and moose caused by roads and the railway in Banff National Park.

Subject: MF1

Area: B

Source: CWSE

EL0117

Martinka, C.J. 1969.
An incidence of mass elk drowning.
J. Mammal. 50(3):640-641.

Describes a mass drowning of elk, and the possible cause. The incident took place at Glacier National Park, Montana.

Subject: MF1

Area: B

Source: CWSE

EL0127

Murie, O.J. 1951.
The elk of North America.
Wildl. Manage. Inst. Washington, D.C.

Very detailed book which discusses many aspects of elk in North America. Topics covered are : history, habitat, migration, physical characteristics,

reproduction, mortality factors, diseases and parasites, food habits, population dynamics and management.
 Subject: PD1 BE1 MF1 MA1 Area: B Source: CWSE WNPL

HUNTING (MF2)

EL0239

Boyd, R.J. 1971.
 White River elk population components.
 Colorado Game, Fish and Parks Dept. Denver, Colorado.

Discusses the effects of specified season permits on elk herd populations in the White River Basin, Colorado. Also determines age and sex ratios of the herds.
 Subject: PD5 MF2 Area: B Source: DIAL

EL0240

Jantzen, R.A. 1961.
 Elk management information.
 Arizona Game and Fish Dept. Arizona.

Gives a twenty-five year summary of harvest statistics of elk on the Gila River Basin, Arizona.
 Subject: MA3 MF2 Area: B Source: DIAL

EL0111

Mack, T. and M. Howarth. 1983.
 Twin Butte survey, Feb. 1983.
 Alta. Energy and Natural Resources, Fish and Wildl. Div. Lethbridge, Alberta.

Documents the results of a survey of landowners around the Twin Butte and Waterton Lakes National Park areas. The survey discovered the damage that ungulate and bear populations are causing, as well as the attitudes of the landowners to the new elk draw in F300 and the spring grizzly hunt. Also makes suggestions for controlling ungulate damage on ranchland.
 Subject: MA5 MF2 Area: A Source: AFWL

EL0156

Schallenberger, A.
 The Sun River Game Preserve.
 Montana Outdoors.

Gives a general description of elk and bighorn sheep competition, elk hunting, and management procedures for elk on the Sun River Game Preserve, Montana.
 Subject: RA2 MF2 MA2 Area: B Source: CWSE

EL0168

Stelfox, J.G. 1958.
 1957 big game harvest in zones 7,8,9 and 10, and 1958 recommendations.
 Can. Wildl. Serv. Edmonton, Alberta.

Gives detailed data of the big game harvests and hunting pressure in zones 7 through 10 during the hunting season in 1957. Recommendations for the 1958 seasons are included, as based on the results of the 1957 season.
 Subject: MF2 Area: B Source: CWSE

EL0172

Stelfox, J.G. 1966.
 Deer and elk population, harvests, range conditions and proposed 1966 seasons.
 Alta. Fish and Wildl. Div. Edmonton, Alberta.

Documents the populations, species, age and sex composition of the 1965 harvest for elk and deer in northwestern Alberta. Proposes the 1966 harvest season.

Subject: PD5 MF2 MA3 Area: B Source: CWSE AFWE

EL0166

Stelfox, J.G. 1955.
 Results of the big game hunting season for 1955.
 Can. Wildl. Serv. Edmonton, Alberta.

Documents the results of the big game hunting season for elk, deer and moose in the Athabasca Forest Reserve, the Coalbranch District and Entwistle to Jasper Park, Alberta. Some hunter observations, as well as a short listing of diseases and parasites and predators are included. Covers the season from November to December, 1955.

Subject: MF2 Area: B Source: CWSE

EL0167

Stelfox, J.G. 1956.
 Big game harvest in the Brazeau, Pembina, McLeod, Athabasca, Smoky River watersheds.
 Can. Wildl. Serv. Edmonton, Alberta.

Documents results of the hunting season for elk, deer and moose in western Canada. Some hunter observations, as well as short listings of diseases and parasites and predators are included. The season ran from October to November, 1956.

Subject: MF2 Area: B Source: CWSE

PREDATION (MF3)

EL0033

Cole, G.F. 1972.
Grizzly bear - elk relationships in Yellowstone National Park.
J. Wildl. Manage. 36(2):556-561.

Gives information on some relationships between grizzly bears and a naturally regulated elk population which stays within west-central Yellowstone National Park all year long. Discusses how predation effects the population dynamics of the elk herd.

Subject: MF3 PD1

Area: B

Source: UOAL

EL0206

Weaver, J.L. 1979.
Wolf predation upon elk in the Rocky Mountain parks of North America : a review. In North American elk : ecology, behavior and management. Boyce and Hayden-Wing, eds. pp.29-33.
Univ. of Wyoming. Laramie, Wyoming.

Examines wolf predation upon elk in the Rocky Mountain parks of North America. Method used for the study is an extensive literature review.

Subject: MF3

Area: B

Source: CWSE

NUTRITION (NP1)

EL0019

- Bobek, B., R. Kunelius and J. Weiner. 1980.
Energy balance and population structure of elk (*Cervus canadensis*) in Banff National Park.
Parks Canada, Western Reg. Office. Calgary, Alberta.

Report outlines a comparison of energy requirements versus potential energy consumption of elk in Banff National Park. Different aspects of nutrition are studied, as well as the effect of nutritional balance on population growth.
Subject: NP1 NP4 Area: B Source: KPWL

EL0028

- Carbyn, L.N. 1975.
Factors influencing activity patterns of ungulates at mineral licks.
Can. J. Zool. 53(4):378-384.

Studies the seasonal and daily visits to mineral licks by elk and mule deer during May to August, 1971 and 1972. Analyzes presence at lick sites in relation to time of day, temperature, humidity, and presence of predators. The licks studied were located in Jasper National Park, Alberta.
Subject: NP1 Area: B Source: WNPL

EL0097

- Knight, R.R. and M.R. Mudge. 1967.
Characteristics of some natural licks in the Sun River Area, Montana.
J. Wildl. Manage. 31(2):293-299.

Describes geological, chemical, and biological features of natural licks in the Sun River Area, Montana. Discusses the observations of big game animals, predominantly elk, at these locations.
Subject: NP1 Area: C Source: UOAL

EL0245

- Pallesen, J.D. 1979.
Nutritive value of mule deer and elk diets and forages on lodgepole pine summer range in Utah.
M.Sc. Thesis, Utah State Univ., Logan, Utah.

Summer forages and diets of mule deer and elk from five lodgepole pine habitats were analysed for nutritional components (in vitro dry matter digestibility, crude protein, neutral-detergent fibre, phosphorus and calcium). Estimated nutrient consumption and availability (kg/ha) were determined for comparison in each habitat subunit.
Subject: NP1 NP2 Area: B Source: UOAL

EL0174

Stelfox, J.G. 1969.

Ungulates as primary consumers.

Lecture presented to : 8'th Ann. Regional Park Warden School, May 27, 1969 at Jasper National Park.

Discusses the relationships of wild ungulates to plant associations, and the effects of environmental carrying capacities, seasonal changes in forage nutrition and palatability, and climate on ungulates in the Canadian Rocky Mountains. Some general population distributions are included as well.

Subject: RA1 NP1 RA4

Area: A

Source: CWSE

EL0190

Thorne, E.T., R.E. Dean and W.G. Hepworth. 1976.

Nutrition during gestation in relation to successful reproduction in elk.
J. Wildl. Manage. 40(2):330-335.

Discusses the relation of nutrition during gestation and successful reproduction in Rocky Mountain elk in Wyoming. The importance of the information when determining winter feeding levels is also considered.

Subject: PD4 NP1

Area: B

Source: UOAL

EL0209

Westra, R. 1978.

The effect of temperature and season on digestion and urea-kinetics in growing wapiti.

PhD. Thesis, Univ. of Alberta. Edmonton, Alberta.

The objective of this study was to partition the effects of season and temperature on growth, digestive function and utilization of nitrogen by growing wapiti offered a ration of constant quality....This study also provided an opportunity to record data on early rearing, antler development and behavior of captive wapiti. Wapiti were obtained from the University of Alberta Research Station and the State of Wyoming Game and Fish Commission, Sybill Research Station.

Subject: NP1 PD4

Area: B

Source: UAAS

EL0244

Westra, R. and R.J. Hudson. 1981.

Digestive function of wapiti calves.

J. Wildl. Manage. 45(1):148-155.

The study was designed to investigate seasonal changes in the digestive function of wapiti calves, and to determine the importance of ambient temperature to the digestive function. Outlines dry matter intake, apparent digestibilities of dry matter, energy, nutrition, fiber and fat, and retention time of digesta in wapiti calves (*Cervus elaphus nelsoni*) that were either exposed to outside ambient temperatures or housed at 18 degrees Celsius.

Subject: NP1 NP3

Area: B

Source: UOAL

FOOD HABITS (NP2)

EL0247

- Boltz, M.J. 1979.
Impacts of prescribed burns and clearcuts upon summer elk food habits, diet quality, and distribution in central Washington.
M.Sc. Thesis, Washington State Univ.

Evaluated impacts of prescribed burns on elk distributions, food habits and diet quality in upper Naneum Creek, Kittitas County, Washington. Seasonal trend in elk habitat use were related to phenology and utilization-induced habitat changes.

Subject: BE6 RA7 MA4 NP2 Area: B Source: UOAL

EL0246

- Collins, W.B. 1979.
Feeding behavior and habitat selection of deer and elk on northern Utah summer range.
M.Sc. Thesis, Utah State Univ., Dept. Range Science, Logan, Utah.

Examined feeding behaviour and habitat preferences of mule deer and elk in aspen and lodgepole pine habitat types. Purpose was to determine where deer and elk prefer to graze and rest within these habitat types and to consider what species-specific characteristics contribute to their differing forage and habitat preferences.

Subject: BE4 BE3 NP2 Area: B Source: UOAL

EL0034

- Collins, W.B., P.J. Urness and D.D. Austin. 1978.
Elk diets and activities on different lodgepole pine habitat segments.
J. Wildl. Manage. 42(4):799-810.

Determines bi-weekly diets, dietary consumption rates, activity patterns, and relative habitat-segment preferences of unconfined elk on different segments of lodgepole pine summer range. The study area is the Little Brush Creek drainage of the Ashley National Forest, Utah.

Subject: BE3 NP2 NP4 Area: B Source: LARS

EL0035

- Constan, K. 1967.
Bighorn sheep range use, food habits and relationships to mule deer and elk in Gallatin Canyon.
Big Game Research, Montana Fish and Game Dept. Montana.

Detailed description of range use, food habits and interspecific relationships of bighorn sheep, mule deer and elk. Some research techniques were also included. The study was conducted in Gallatin Canyon, in southwestern Montana.

Subject: RA4 BE4 NP2 Area: B Source: CWSE

EL0036

Constan, K.J. 1972.

Winter foods and range use of three species of ungulates.
J. Wildl. Manage. 36(4):1068-1076.

Documents range usage, food habits, population characteristics and interspecific relationships of bighorn sheep, mule deer, and elk on the Deer Creek-Asbestos Creek winter-spring range in Gallatin Canyon, southwestern Montana.
Subject: BE4 NP2 RA4 Area: B Source: UOAL

EL0017

D.A., Blood. 1966.

Range relationships of elk and cattle in Riding Mountain National Park, Manitoba.
Wildl. Manage. Bull. Series 1, #9., Can. Wildl. Serv. Edmonton, Alberta.

Bulletin is arranged in four sections : (1)Description and ecology, of the study area, (2)the elk population, (3)elk food habits, and (4)elk- cattle competition. The study area is Riding Mountain National Park, Manitoba.
Subject: RA2 PD2 NP2 Area: B Source: WNPL

EL0063

Gordon, F.A. 1968.

Range relationships of elk and cattle on elk winter range, Crow Creek, Montana.
Big Game Research Project, State of Montana.

Studies food habits, range distribution, forage utilization, and interspecific relationships of elk and cattle from 1967-1969 on the Crow Creek Drainage, Montana. Some history of elk and cattle usage was given as well as a description of the physiography and vegetation.
Subject: RA4 BE4 NP2 Area: B Source: AFWL

EL0075

Hansen, R.M. and 1975.

Diet overlap of deer, elk and cattle in southern Colorado.
J. Range Manage. 28(1):43-47.

Seasonal dietary overlaps for mule deer, elk and cattle were estimated through analysis of fecal samples taken from Dec. 1970 to Nov. 1971. The study area was a private ranch in Colorado.
Subject: BE3 NP2 RT11 Area: B Source: AFWL

EL0079

Hobbs, N.T., D.L. Baker J.E. Ellis and D.M. Swift. 1979.

Composition and quality of elk diets during winter and summer : a preliminary analysis. In North American elk : ecology, behavior and management, Boyce and Hayden-Wing, Eds. pp. 47-53.
Univ. of Wyoming. Wyoming.

Details a study carried out in Rocky Mountain National Park, Colorado, to determine the composition and quality of elk diets on both summer and winter ranges. Methods used were outlined in detail.
Subject: NP2 RT11 Area: B Source: CWSE

EL0241

Hudson, R.J. and M.T. Nietfeld. 1985.
Effect of forest depletion on the feeding rate of wapiti.
J. Range Manage. 38(1):80-82.

Documents a study done which evaluated forage intake rates of wapiti (*Cervus elaphus nelsoni*) during the depletion of a grass sward over a 7-day period. Relates bite sizes to forage biomass and plant height.
Subject: NP2 BE5 Area: B Source: UOAL

EL0089

Julander, O. and D.E. Jeffrey. 1964.
Deer, elk and cattle range relations on summer range in Utah.
Trans. North Amer. Wildl. Nat. Resources Conf. 29:404-414.

Discusses range utilization and forage preferences for deer, elk and cattle on the Willow Creek range, Utah.
Subject: RA4 BE3 NP2 Area: B Source: UABA

EL0113

Mair, W.W. 1952.
The impact of an introduced population of elk upon the biota of Banff National Park.
M.A. Thesis, Univ. of B.C. Vancouver, British Columbia.

Detailed investigation into elk movements, food habits, range usage, and wildlife interactions in Banff National Park, Alberta.
Subject: RA4 BE4 NP2 PD2 Area: B Source: CWSE

EL0248

McReynolds, S.J. 1977.
Seasonal elk food habits and diet quality in central Washington.
M.Sc. Thesis, Wash. State Univ., Dept. Forestry and Range Manage.

Analysed seasonal diets of elk from microhistological examination of plant fragments in fecal material. Performed proximate analysis of forage samples in all seasons (moisture, crude protein, crude fat, ADF, ash, Ca and P). Seasonal diet composition and plant chemical composition were combined to determine seasonal nutrient intake.
Subject: NP2 RT11 Area: B Source: UOAL

EL0119

Miller, R.F. and M. Vavra. 1981.
Deer, elk and cattle diets in northeastern Oregon rangelands.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:500-508.

Summarizes diet information for elk, cattle and deer, obtained from four studies in the Blue Mountains, and the Wallowa Mountains in northeastern Oregon. The diets of the deer and elk are covered for winter, spring and summer, while the cattle are investigated from late June until early October.
Subject: NP2 RA2 Area: B Source: AFWL

EL0242

Morgantiti, L.E. and R.J. Hudson. 1985.
Changes in diets of wapiti during a hunting season.
 J. Range Manage. 38(1):77-79.

This study was conducted to assess the impact of hunting on diets of wapiti (*Cervus elaphus*) population in west-central Alberta, Canada.
 Subject: BE6 NP2 Area: B Source: UOAL

EL0124

Morris, M.S. and J.E. Schwartz. 1957.
Mule deer and elk food habits on the National Bison Range.
 J. Wildl. Manage. 21(2):189-193.

Discusses the forage preferences and the range vegetation of mule deer and elk on the National Bison Range, Montana. Methods used were sample plot range determinations and stomach analysis of the animals.
 Subject: RA4 NP2 RT3 Area: B Source: CWSE

EL0245

Pallesen, J.D. 1979.
Nutritive value of mule deer and elk diets and forages on lodgepole pine summer range in Utah.
 M.Sc. Thesis, Utah State Univ., Logan, Utah.

Summer forages and diets of mule deer and elk from five lodgepole pine habitats were analysed for nutritional components (in vitro dry matter digestibility, crude protein, neutral-detergent fibre, phosphorus and calcium). Estimated nutrient consumption and availability (kg/ha) were determined for comparison in each habitat subunit.
 Subject: NP1 NP2 Area: B Source: UOAL

EL0148

Ream, B., B. Beall and L. Marcum. 1971.
Sapphire Range elk ecology study - elk, logging and people.
 School of Forestry, Univ. of Montana. Montana.

Outlines a study of elk on the Sapphire range, Montana. Main topics include capture and marking of elk, and their habitat use and food preferences. Some information on logging, and the effects of that on the range is given.
 Subject: BE3 MA4 NP2 Area: B Source: CWSE

EL0149

Reid, L.D. 1973.
Diet similarity between mule deer, elk and cattle in south-central Colorado.
 MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Discusses range relationships, interspecific competition and forage preferences for mule deer, elk and cattle, and the factors which influence the magnitude of these relationships. The study area is south-central Colorado. Included is an extensive literature review on this subject.
 Subject: BE3 BE4 RA2 NP2 Area: B Source: LARS

EL0150

Reid, L.D. and R.M. Hansen. 1973.
Diets of elk, deer, and cattle near Fort Garland, Colorado.
Colorado State Univ. Expt. Station. Fort Collins, Colorado.

Gives an account for the overlap percentages of range plants that are divided between elk and deer, and between deer, elk and cattle on range used only in the summer by cattle. The study was conducted near Fort Garland, Colorado.

Subject: NP2 RA2 Area: B Source: LARS

EL0161

Singleton, J. 1976.
Food habits of wild ungulates in British Columbia : bibliography and plant synopsis.
B.C. Fish and Wildl. Branch, Dept. Recreation and Travel Industry.

Describes food habits of moose, elk, deer, mountain goats and bighorn and thimhorn sheep in British Columbia. Included is a bibliography for each animal, as well as a plant synopsis for the habitat.

Subject: NP2 BW Area: B Source: CWSE

EL0165

Snyder, R.O. 1966.
Forage competition between cattle and elk in the Gird Creek Drainage of western Montana.
MSc. Thesis, Univ. of Montana. Missoula, Montana.

Determines the extent of the actual and potential forage competition between cattle and elk in the Gird Creek Drainage in western Montana. Looks at food preferences and nutrition of elk and cattle, and describes forage of the study area. The study techniques used are outlined in detail.

Subject: NP2 RA2 RT3 Area: B Source: CWSE

EL0199

Ward, A.L. 1971.
In vitro digestibility of elk winter range forage in southern Wyoming.
J. Wildl. Manage. 35(4):681-688.

Dry-matter digestibility coefficients were determined on several south-central Wyoming forage species using elk (*Cervus canadensis*) and steer rumen inocula. Study areas are winter feeding sites of elk on the south end of the Medicine Bow Range in Wyoming.

Subject: NP2 Area: B Source: UOAL

EL0211

Woolf, A. 1968.
Summer ecology of bighorn sheep in Yellowstone National Park.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Documents the problem of competition between sheep and elk in Yellowstone National Park. The dominant plant and staple foods of both species are discussed.

Subject: RA2 BE3 NP2 Area: B Source: ANNB

 PHYSIOLOGY (NP3)

EL0054

- Flook, D.R. 1970.
Causes and implications of an observed sex differential in the survival of wapiti.
 Can. Wildl. Serv. Report Series Number 11. Edmonton, Alberta.

Examines the population dynamics of wapiti in some of the national parks in Canada. Investigates some of the physical and physiological factors affecting the welfare of wapiti, in order to determine how they are phased with the seasons of the year, and how they affect animals of different sex and age. The factors studied were tooth wear, growth, reproduction, fat reserves and adrenal activity.

Subject: NP3 PD1

Area: A Source: CWSE WNPL

EL0220

- Golley, F.B. and H.K. Buechner. 1968.
A practical guide to the study of productivity of large herbivores.
 Blackwell Scientific Pub., International Biological Programme Handbook #7. Edinburgh.

Technical guidebook to the study of productivity in large mammals including both domesticated and undomesticated animals. Pertinent to agricultural range management, wildlife management, physiological, veterinary and ecological disciplines.

Subject: NP3 MA1

Area: B Source: UOAL

EL0144

- Pederson, R.J. and A.A. Pederson. 1975.
Blood chemistry and hematology of elk.
 J. Wildl. Manage. 39(3):617-620.

Documents 11 hematologic and 13 blood chemical characteristics of blood samples obtained from Rocky Mountain elk (*Cervus canadensis nelsoni*). Compares these values between various age and sex groups. The area of study was Bobsled Ridge, Umatilla County, Oregon.

Subject: RT6 NP3

Area: B Source: UOAL

EL0244

- Westra, R. and R.J. Hudson. 1981.
Digestive function of wapiti calves.
 J. Wildl. Manage. 45(1):148-155.

The study was designed to investigate seasonal changes in the digestive function of wapiti calves, and to determine the importance of ambient temperature to the digestive function. Outlines dry matter intake, apparent digestibilities of dry matter, energy, nutrition, fiber and fat, and retention time of digesta in wapiti calves (*Cervus elaphus nelsoni*) that were either exposed to outside

ambient temperatures of housed at 18 degrees Celsius.
 Subject: NP1 NP3 Area: B Source: UOAL

BIOENERGETICS (NP4)

EL0019

Bobek, B., R. Kunelius and J. Weiner. 1980.
 Energy balance and population structure of elk (*Cervus canadensis*) in Banff National Park.
 Parks Canada, Western Reg. Office. Calgary, Alberta.

Report outlines a comparison of energy requirements versus potential energy consumption of elk in Banff National Park. Different aspects of nutrition are studied, as well as the effect of nutritional balance on population growth.
 Subject: NP1 NP4 Area: B Source: KPWL

EL0034

Collins, W.B., P.J. Urness and D.D. Austin. 1978.
 Elk diets and activities on different lodgepole pine habitat segments.
 J. Wildl. Manage. 42(4):799-810.

Determines bi-weekly diets, dietary consumption rates, activity patterns, and relative habitat-segment preferences of unconfined elk on different segments of lodgepole pine summer range. The study area is the Little Brush Creek drainage of the Ashley National Forest, Utah.
 Subject: BE3 NP2 NP4 Area: B Source: LARS

EL0059

Gates, C.C. 1980.
 Patterns of behavior and performance of wapiti (*Cervus elaphus nelsoni*) in the boreal mixed wood forest.
 PhD. Thesis, Univ. of Alta. Edmonton, Alberta.

Study investigates the behavior and productivity of wapiti in relation to seasonal changes in physical and biotic elements of a boreal mixed wood environment in central Alberta. Aspects of behavior studied include foraging and habitat selection, activity budgets, Circadian activity patterns, and weight dynamics.
 Subject: BE3 NP4 RT5 BE5 Area: B Source: UAAS

EL0153

Robbins, C.T., Y. Cohen and B.B. Davitt. 1979.
 Energy expenditure by elk calves.
 J. Wildl. Manage. 43(2):445-453.

Discusses bioenergetics of elk calves (*Cervus canadensis*). Relates the energy used to factors such as horizontal and vertical locomotion. Outlines the most effective indicators of energy expenditure.
 Subject: NP4 RT5 Area: B Source: UABA

EL0183

Struhsaker, T.T. 1967.
Behavior of elk (*Cervus canadensis*) during the rut.
Z. Tierpsychol. 24:80-114.

Presents detailed descriptions of elk behavior observed during the rut and quantitative data on certain aspects of these behavior patterns. The study was conducted in the Rocky Mountains of Banff National Park, Alberta.

Subject: BE1 NP4

Area: B

Source: CWSE

EL0184

Struhsaker, T.T. and A. Parsekian. 1965.
The relation of age, sex and time of day to activity in free-ranging elk (*Cervus canadensis*).
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Studies the relationship of activity of elk to age, sex and time of day. The study area is Banff National Park, Alberta. Some details on the methods used are also given.

Subject: NP4 RT5

Area: B

Source: CWSE

 POPULATION DYNAMICS (PD1)

EL0012

- Bartels, R. and R. Denney. 1969.
 Analysis of factors contributing toward declining elk populations in the Chesnimus Unit.
 Game Div., Special Report. Wallowa District, Oregon.

Report examines various factors which could be contributing to the declining elk population in the Chesnimus Unit. The factors discussed include population, production, elk management, disease, predation, range conditions, and harassment. Recommendations are included after the discussion of causes.
 Subject: PD1 MA1 Area: B Source: CWSE

EL0020

- Boyce, M.S. and L.D. Hayden-Wing Eds. 1979.
 North American elk : ecology, behavior and management.
 Univ. of Wyoming. Laramie, Wyoming.

An extensive collection of articles dealing with population biology, habitat ecology, behavior, pathology and nutrition, and management of elk in North America.
 Subject: RA1 BE1 PD1 MA1 Area: B Source: CWSE

EL0021

- Boyd, R.J. 1980.
 American elk. In Big game of North America, ecology and management., Schmidt and Gilbert, Eds.
 Stackpole Books. Harrisburg, Pennsylvania.

General description of American elk : their distribution, physical characteristics, life history, population dynamics, habitat, and management. A good overview on the life of wapiti in North America.
 Subject: PD1 BE3 MA1 Area: B Source: AFWL

EL0032

- Cole, G.F. 1969.
 Elk and the Yellowstone ecosystem.

Discusses man's influence on elk and their habitat in Yellowstone National Park. Some historical and present aspects of herd population dynamics are outlined. Management objectives are discussed in light of the problem.
 Subject: MA3 PD1 Area: B Source: CWSE

EL0033

- Cole, G.F. 1972.
Grizzly bear - elk relationships in Yellowstone National Park.
J. Wildl. Manage. 36(2):556-561.

Gives information on some relationships between grizzly bears and a naturally regulated elk population which stays within west-central Yellowstone National Park all year long. Discusses how predation effects the population dynamics of the elk herd.

Subject: MF3 PD1

Area: B

Source: UOAL

EL0054

- Flook, D.R. 1970.
Causes and implications of an observed sex differential in the survival of wapiti.
Can. Wildl. Serv. Report Series Number 11. Edmonton, Alberta.

Examines the population dynamics of wapiti in some of the national parks in Canada. Investigates some of the physical and physiological factors affecting the welfare of wapiti, in order to determine how they are phased with the seasons of the year, and how they affect animals of different sex and age. The factors studied were tooth wear, growth, reproduction, fat reserves and adrenal activity.

Subject: NP3 PD1

Area: A

Source: CWSE WNPL

EL0115

- Martinka, C.J. 1969.
Population ecology of summer resident elk in Jackson Hole, Wyoming.
J. Wildl. Manage. 33(3):465-481.

Documents distribution, population status, social habits, movements and habitat relationships of elk (*Cervus canadensis*) in Jackson Hole, Wyoming.

Subject: BE3 PD1

Area: B

Source: UOAL

EL0116

- Martinke, C.J. 1969.
Ungulate winter ecology studies, Glacier National Park.
National Park Serv. Prog. Report, 1968-1969. Glacier National Park, Montana.

Compiles quantitative data on winter distribution, movements, population dynamics, habitat relationships, and ecology of elk (*Cervus canadensis*) and mule deer. The main study area was the Middle Fork Flathead River drainage, and further studies were conducted on the Belton Hills winter range, and throughout the Middle Forks drainage in Glacier National Park, Montana.

Subject: PD1 BE2 BE3 BE4

Area: B

Source: WNPL

EL0127

- Murie, O.J. 1951.
The elk of North America.
Wildl. Manage. Inst. Washington, D.C.

Very detailed book which discusses many aspects of elk in North America. Topics covered are : history, habitat, migration, physical characteristics, reproduction, mortality factors, diseases and parasites, food habits, population dynamics and management.

Subject: PD1 BE1 MF1 MA1 Area: B Source: CWSE WNPL

EL0157

Schmidt, J.L. and eds. D.L. Gilbert 1980.
Big game of North America, ecology and management.
 Stackpole Books. Harrisburg, Pennsylvania.

A good reference on the ecology and management of the big game of North America. Includes short articles on various animals, and concludes with a series of reports dealing specifically with habitat and management problems.

Subject: BE1 MA1 RA1 PD1 Area: B Source: AFWL AFWE

EL0230

Soper, J.D. 1973.
The mammals of Waterton Lakes National Park, Alberta.
 Can. Wildl. Serv. Edmonton, Alberta.

The aim of this publication is to present for the first time a relatively full field account of the mammals of Waterton Lakes National Park, Alberta, together with descriptions of the existing environmental niches.... A total of 55 species are dealt with under subheads in regard to subspecies, measurements, status, habitat and reproduction, followed by general remarks.

Subject: PD1 Area: A Source: WNPL

EL0189

Thomas, J.W. and D.E. Toweill. 1982.
Elk of North America, ecology and management.
 Stackpole Books. Harrisburg, Pennsylvania.

A collection of articles dealing primarily with the ecology and management of the elk of North America. Some specific topics are : classification and distribution, physiology, diseases and parasites, behavior, habitat and food preferences, land and elk management, and recreational use of elk. Very detailed analysis of the subject matter.

Subject: PD1 BE1 MA1 Area: B Source: AFWL

EL0224

Wallis, C. 1980.
Montane, foothills parkland and southwest rivers : natural landscapes survey 1978-79.
 Parks Div., Resource Assessment and Management Section. Edmonton, Alberta.

Documents data collected on land use, fauna, flora and landscape characteristics. Previously studied sites and the new study areas were compared from floristic, faunal, geological and landscape viewpoints and ecological values. The study area is the montane and foothills parkland sections of the Rocky Mountain Natural Region from Longview south to the U.S. border.

Subject: RA1 PD1 MA6 Area: A Source: ARPL

HISTORIC POPULATIONS (PD2)

- EL0041
- Craighead, J.J. 1952.
 A biological and economic appraisal of the Jackson Hole elk herd.
 New York Zool. Soc. and Conservation Found. New York, U.S.A.
- Outlines past and present population dynamics of the Jackson Hole elk herd in Wyoming. Management techniques, especially winter range improvement and artificial feeding of elk are discussed with respect to declining numbers.
 Subject: PD2 MA3 Area: B Source: CWSE
- EL0017
- D.A., Blood. 1966.
 Range relationships of elk and cattle in Riding Mountain National Park, Manitoba.
 Wildl. Manage. Bull. Series 1, #9., Can. Wildl. Serv. Edmonton, Alberta.
- Bulletin is arranged in four sections : (1)Description and ecology, of the study area, (2)the elk population, (3)elk food habits, and (4)elk- cattle competition. The study area is Riding Mountain National Park, Manitoba.
 Subject: RA2 PD2 NP2 Area: B Source: WNPL
- EL0045
- Dwyer, M.V. 1969.
 The ecological characteristics and historical distribution of the family Cervidae in Alberta.
 MSc. Thesis, Univ. of Alta. Edmonton, Alberta.
- Dissertation traces historical distribution of Cervidae members indigenous to Alberta. Review intraspecific and interspecific relationships and forage requirements of the family Cervidae in general. Each species is then discussed individually with a description of the species, ecology, and summary of the historical distribution. A map of present day distribution is included as well.
 Subject: PD2 BE2 BE4 Area: A Source: AFWL
- EL0064
- Green, H.U. 1946.
 The elk of Banff National Park.
 The National Parks Serv. Ottawa, Canada.
- Discusses population dynamics, distribution, general behavior and various mortality factors of elk in Banff National Park. Included in mortality factors are predators, diseases and parasites.
 Subject: PD2 MF1 Area: B Source: KPWL
- EL0091
- Kerr, G.R. 1964.
 Big game aerial survey.
 Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Documents the results of an aerial survey for big game in District #1 in Alberta. Gives information on elk, deer, moose and other animals observed and classified.

Subject: BE2 PD2 RT4

Area: B

Source: AFWL

EL0113

Mair, W.W. 1952.

The impact of an introduced population of elk upon the biota of Banff National Park.

M.A. Thesis, Univ. of B.C. Vancouver, British Columbia.

Detailed investigation into elk movements, food habits, range usage, and wildlife interactions in Banff National Park, Alberta.

Subject: RA4 BE4 NP2 PD2

Area: B

Source: CWSE

EL0170

Stelfox, J.G. 1964.

Elk in northwestern Alberta.

Land-Forest-Wildl. 6(5):14-23.

Describes the historical and present population status of wapiti in northwestern Alberta. Four herds (Brazeau, Hinton, Jasper and Peace River) are specifically dealt with, and a map indicating the present and past distribution is included.

Subject: PD2 BE2

Area: B

Source: CWSE

HEALTH AND CONDITION (PD3)

EL0005

Adcock, J.L. and C.P. Hibler. 1969.

Vascular and neuro-ophthalmic pathology of elaeophorosis in elk.

Path. Vet. 6:185-123.

Reports on the pathology (vascular and neuro-ophthalmic) of elaeophorosis in elk (*Cervus canadensis*) in the Rocky Mountain regions of the United States. Discusses the possible causes and nature of the disease.

Subject: PD3

Area: B

Source: CWSE

EL0040

Cowan, I.McT. 1951.

The diseases and parasites of big game animals of western Canada.

Report Proc. Fifth Annual Game Conv., Vancouver, B.C. April 25-28, 1951:37-64.

Documents in detail the different diseases and parasites affecting the game animals of western Canada. Most data is taken from a survey of 121 big game animals. Each internal and external parasite of the host was listed.

Subject: PD3

Area: A

Source: KPNL

EL0055

- Flook, D.R. and J.E. Stenton. 1969.
Incidence and abundance of certain parasites in wapiti in the national parks of the Canadian Rockies.
Can. J. Zool. 47(5):795-803.

Looks at the seasonal and spatial distributions, as well as the relationship of intensity and incidence of infections to age and sex of wapiti. Wapiti were obtained from Banff, Waterton Lakes, and Kootenay national parks, and the Ya Ha Tinda Ranch.

Subject: PD3

Area: A Source: CWSE

EL0065

- Greer, K.R. 1968.
A compression method indicates fat content of elk (wapiti) femur marrows (condition criterion).
J. Wildl. Manage. 32(4):747-751.

Describes a compression method which evaluates the fat content of elk femur marrows. Looks at the cost and accuracy of this method.

Subject: RT12 PD3

Area: B Source: UABA

EL0085

- Jacobson, R.H., D.E. Worley and K.R. Greer. 1969.
The fringed tapeworm (*Thysanosoma actinioides*) as a parasite of the Rocky Mountain elk in Yellowstone National Park.
Bull. Wildl. Dis. Assoc. 5:95-98.

Documents incidence of *Thysanosoma actinioides* in the Rocky Mountain elk of Yellowstone National Park. Gives details of infections, such as length of the tapeworm, and distribution in the small intestine.

Subject: PD3 RT8

Area: B Source: ADRI

EL0130

- McBee, R.H., J.L. Johnson and M.P. Bryant. 1969.
Ruminal microorganisms from elk.
J. Wildl. Manage. 33(1):181-186.

Gives details of the numbers and kinds of bacteria and protozoa present in the rumen contents of four Yellowstone elk (*Cervus canadensis*). Outlines the use of studies of this type for assessing animal and environmental conditions.

Subject: RT6 PD3

Area: B Source: UABA

EL0125

- Morton, J.K. and N. Kingston. 1976.
Further studies on Trypanosomes in game animals in Wyoming.
J. Wildl. Dis. 12(2):233-236.

Discusses *Trypanosoma* sp. infections in game animals (elk, deer, pronghorn, moose, bighorn sheep) in Wyoming. Blood samples for the analyses were taken from captive ungulates in that area.

Subject: PD3

Area: B Source: UOAL

EL0136

- Neiland, K. and C. Dukeminier. 1972.
A bibliography of the parasites, diseases and disorders of several important wild ruminants of the northern hemisphere.
Alaska Dept. Fish and Game, Game Technical Bull. #3.

Lists several publications and articles pertaining to the diseases and parasites, and physical disorders of wild ruminants in the northern hemisphere.
Subject: PD3 BW Area: B Source: ADRI

EL0181

- Stock, T.M. and M.W. Barrett. 1983.
Helminth parasites of the gastrointestinal tracts and lungs of moose (*Alces alces*) and wapiti (*Cervus elaphus*) from Cypress Hills, Alberta, Canada.
Proc. Helminthol. Soc. Wash. 50(2):246-251.

Discusses incidence of the helminthic parasites of moose and wapiti (*Cervus elaphus*) after examining the gastrointestinal tracts and lungs of the animals. Animals were taken from the Cypress Hills area, Alberta.
Subject: PD3 Area: B Source: ADRI

EL0182

- Stott, J.L., L.H. Lauerma and A.J. Ruedke. 1982.
Bluetongue virus in elk (*Cervus canadensis*) and their calves.
Amer. Med. J. Vet. Res. 43(3):423-428.

Discusses the effects of inoculation of pregnant elk with Bluetongue virus serotype II. Includes full description of methods used for experimentation.
Subject: RT8 PD3 Area: B Source: UABA

EL0185

- Taber, R.D. 1958.
Development of the cervid antler as an index of late winter physical condition.
Proc. Acad. Sciences 18:27-28.

Discusses growth and development of cervid antlers as an indication of physical condition in the late winter.
Subject: PD3 RT12 Area: B Source: CWSE

EL0191

- Thorne, E.T., J.K. Morton and W.C. Ray. 1979.
Brucellosis, its effect and impact on elk in western Wyoming. In North American elk, behavior and management. pp. 212-220.
Univ. of Wyoming. Laramie, Wyoming.

Documents the results of a ten year study investigating the incidence and effect of Brucellosis on elk on the National Elk Refuge and Greys River Feedground, Wyoming. Included is an evaluation of four serologic tests for detection of Brucellosis in wild elk.
Subject: PD3 RT8 Area: B Source: LARS

EL0215

- Warley, D.E. and R.E. Barrett. 1980.
 Hosts and distribution of *Capillaria bovis* (Shnyder, 1906) in domestic and wild ruminants in northwestern United States.
 J. Parasit. 66(4):695-696.

Documents the hosts and distribution of the ruminant intestinal capillariid, *Capillaria bovis* (Shnyder, 1906) in wild ruminants in the northwestern United States.

Subject: PD3

Area: B

Source: ADRI

EL0213

- Worley, D.E. 1978.
 Pathology and nutrition.
 Proc. Symp. on Elk Ecology and Manage., Univ. of Wyoming, Laramie, Wyoming. May 3-5, 1978:206-211.

The occurrence of internal and external parasites in Rocky Mountain elk (*Cervus canadensis nelsoni*) from the Wyoming-Montana-Idaho-southern Alberta and British Columbia region is reviewed with reference to the health of native elk herds.

Subject: PD3

Area: A

Source: ADRI

EL0214

- Worley, D.E. and R.E. Barrett. 1963.
 Studies on the parasites of the northern Yellowstone elk herd.
 National Park Serv. Mammoth, Wyoming.

Gives details of observations made on the internal and external parasites of elk of the northern Yellowstone elk herd, Wyoming and Montana. Relates the incidence of parasitism to seasonal and climatic features, and gives general survey data.

Subject: PD3

Area: B

Source: ADRI

EL0217

- Worley, D.E. and K.R. Greer. 1976.
 Parasites and diseases of North American elk (*Cervus spp.*).
 Montana Fish and Game Dept. Montana.

An annotated bibliography for the diseases and parasites of North American elk (*Cervus spp.*). The references are arranged alphabetically, by author.

Subject: BW PD3

Area: B

Source: ADRI

EL0216

- Worley, D.E., R.E. Barrett P.J.A. Presidente and R.H. Jacobson. 1969.
 The Rocky Mountain elk as a reservoir host for parasites of domestic animals in western Montana.
 Proc. Annual Conf. - Bull. Wildl. Disease Assoc. 5:348-350.

Investigates the possibility of Rocky Mountain elk being a suitable host for the parasites of domestic ruminants. The parasites studied were lungworms, gastrointestinal nematodes, tapeworms, and various external parasites.

Subject: PD3

Area: B

Source: ADRI

REPRODUCTION AND GROWTH (PD4)

EL0039

Cowan, I. McT. 1950.

Some vital statistics of big game on overstocked mountain range.
Trans. Fifteenth North Amer. Wildl. Conf., San Francisco, California.
March 6-9, 1950:581-583.

Discusses sex ratios, fertility and effective reproduction of big game animals on overstocked mountain range in Banff, Jasper, Kootenay and Yoho National Parks. Includes a description of range vegetation and utilization.
Subject: PD4 RA2 BE3 Area: B Source: UOAL

EL0053

Flook, D.R. 1967.

A study of the apparent unequal sex ratio of wapiti.
PhD. Thesis, Univ. of Alta. Edmonton, Alberta.

Detailed investigation of the causes of an unbalanced sex ratio among wapiti of the national parks of western Canada. Describes reproductive characteristics, parasites, and population dynamics of the animals.
Subject: PD4 Area: B Source: WNPL

EL0067

Greer, K.R., Jr. and W.W. Hawkins J.E. Catlin. 1968.

Experimental studies of controlled reproduction in elk (wapiti).
J. Wildl. Manage. 32(2):368-376.

Describes a study on controlled reproduction in elk, as a technique designed to decrease overpopulated areas of elk. Various methods were used.
Subject: PD4 MA3 Area: B Source: UOAL

EL0069

Gross, J.E. 1969.

Optimum yield in deer and elk populations.
34th North Amer. Wildl. and Nat. Resources Conf., Washington, D.C.
March 5, 1969.

Discusses how knowledge of population dynamics can be related to practical application in the field of game management. Describes how fecundity - rate changes can give yield curves which can be used for maintaining a balance between deer and elk, and their food supply.
Subject: PD4 MA3 Area: B Source: CWSE

EL0234

Hepworth, W.G. 1966.

General study on breeding habits, gestation, lactation, and young of big game animals.
Wyoming Fish and Game Comm. Wyoming.

Gives gestation, age at sexual maturity, and birth weights for antelope, elk and bighorn sheep on the Sybille Game Research Unit.
Subject: PD4 Area: B Source: DIAL

EL0096

Knight, R.R. 1970.
The Sun River elk herd.
Wildl. Monographs 23:5-66.

Documents results of a study carried out from 1965 to 1969 to determine the causes of low calf production within the Sun River elk herd, Montana.
Subject: PD4 Area: B Source: UABA

EL0190

Thorne, E.T., R.E. Dean and W.G. Hepworth. 1976.
Nutrition during gestation in relation to successful reproduction in elk.
J. Wildl. Manage. 40(2):330-335.

Discusses the relation of nutrition during gestation and successful reproduction in Rocky Mountain elk in Wyoming. The importance of the information when determining winter feeding levels is also considered.
Subject: PD4 NP1 Area: B Source: UOAL

EL0209

Westra, R. 1978.
The effect of temperature and season on digestion and urea-kinetics in growing wapiti.
PhD. Thesis, Univ. of Alberta. Edmonton, Alberta.

The objective of this study was to partition the effects of season and temperature on growth, digestive function and utilization of nitrogen by growing wapiti offered a ration of constant quality....This study also provided an opportunity to record data on early rearing, antler development and behavior of captive wapiti. Wapiti were obtained from the University of Alberta Research Station and the State of Wyoming Game and Fish Commission, Sybill Research Station.
Subject: NP1 PD4 Area: B Source: UAAS

POPULATION SURVEYS (PD5)

EL0151

Anonymous. 1971.
Elk census 1971, Waterton Lakes National Park.
Warden Serv. Waterton Lakes National Park, Alberta.

Documents migrational trend, winter utilization of range, and population density of elk on Stony Flats, Waterton Lakes National Park. Some management recommendations are included.
Subject: PD5 BE2 RA3 Area: A Source: WNPL

EL0009

Armstrong, G.S. 1967.

Big game aerial surveys of the foothills and sub-alpine areas, 1967.
Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge,
Alberta.

Documents results of an aerial survey for big game (elk, moose and mule deer) in the Lethbridge biological district. Covers the period from Jan., 1966 to May, 1967.

Subject: PD5 BE2

Area: B

Source: AFWL

EL0018

Blood, D.A. 1966.

Aerial census of ungulates, Elk Island National Park, winter 1965-1966.
Project M1-1-4, Can. Wildl. Serv. Edmonton, Alberta.

Documents the seasonal distribution of elk in Elk Island National Park, Alberta, during the winter of 1965-1966.

Subject: BE2 PD5

Area: B

Source: CWSE

EL0239

Boyd, R.J. 1971.

White River elk population components.
Colorado Game, Fish and Parks Dept. Denver, Colorado.

Discusses the effects of specified season permits on elk herd populations in the White River Basin, Colorado. Also determines age and sex ratios of the herds.

Subject: PD5 MF2

Area: B

Source: DIAL

EL0022

Brady, K.S. 1973.

Ungulate abundance and distribution, Waterton Lakes National Park.
Warden Serv. Waterton Lakes National Park, Alberta.

The report outlines the abundance and distribution of ungulates in Waterton Lakes National Park from March, 1971 to Nov., 1973. Six ungulate species are dealt with, with an outline of status, distribution, and habitat preference, followed by general remarks.

Subject: BE3 PD5 BE2

Area: A

Source: AFWL

EL0023

Brady, K.S. 1975.

A report on wildlife numbers and distribution.
Warden Serv. Waterton Lakes National Park, Alberta.

Documents the results of a wildlife census and distribution survey conducted in Waterton Lakes National Park during the period of Jan., 1974 to Feb., 1975. Results are included in both discussion and table form. Methodology is given some discussion.

Subject: BE2 PD5 RT4

Area: A

Source: AFWL

EL0232

Christiansen, J.M. 1972.

Aerial survey of ungulates in Waterton Lakes National Park.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Gives results from the February 1972 annual survey of ungulates in Waterton Lakes National Park, Alberta. Distribution maps show relative number of animals for each species, while tables relate numbers, sex, place, elevation, and aspect.

Subject: BE2 PD5

Area: A

Source: CWSE WNPL

EL0030

Clark, J. 1980.

Region 1 elk survey : February 16 and 17, 1980.

Alta. Energy and Nat. Res., Fish and Wildl. Div. Lethbridge, Alberta.

Documents the numbers of elk seen on the winter ranges of the Region 1 area, Alberta. The distribution and trend data received from this is then used as a guide for season setting and female authorization allocations.

Subject: PD5 BE2

Area: A

Source: AFWL

EL0058

Froggatt, K. and B. Hall. 1976.

Region 1 elk survey.

Alta. Recreation and Parks, Fish and Wildl. Div. Lethbridge, Alberta.

Gives elk aerial survey results for 1976 in the Lethbridge region.

Subject: PD5 BE2

Area: A

Source: AFWL

EL0070

Gudmundson, L. 1977.

Region 1 elk survey (March 1977).

Alta. Recreation, Parks and Wildl., Fish and Wildl. Div. Lethbridge, Alberta.

Gives results of the March 1977 aerial elk survey which was completed in order to gain knowledge of the wintering population as well as the distribution of the animals.

Subject: PD5 BE2

Area: A

Source: AFWL

EL0072

Hall, B. 1974.

Region 1 foothills elk survey.

Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Documents the results of an aerial elk survey (March 13,14, 1974) of the Region 1 foothills. Gives population numbers, locations, and observations of neck collars encountered.

Subject: PD5 BE2

Area: A

Source: AFWL

EL0073

Hall, B., K. Froggatt and A. Cook. 1975.

Region 1 elk survey.

Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Presents and discusses results from an aerial survey of elk in Region 1 on March 13, 1975.

Subject: PD5 BE2

Area: A Source: AFWL

EL0092

Kimball, J.F. and M.L. Wolfe. 1974.

Population analysis of a northern Utah elk herd.

J. Wildl. Manage. 38(2):161-173.

Documents population changes of the Cache elk herd (*Cervus canadensis*) in northern Utah. The period studied is 1951-1972. Possible reasons for population fluctuations, and management techniques are also discussed.

Subject: PD5

Area: B Source: UOAL

EL0155

Rost, G.R. and J.A. Bailey. 1979.

Responses of deer and elk to roads on the Roosevelt National Forest.

Discusses the behavioral responses of deer and elk to roads in the Roosevelt National Forest which interfere with their winter range. The method used was pellet group counts, and some discussion as to the accuracy of this method was included.

Subject: BE6 MA4 PD5

Area: B Source: CWSE

EL0171

Stelfox, J.G. 1964.

Bighorn ecological study in the Coalbranch Region (Drummond Creek south to Ruby Creek).

Fish and Wildl. Div., Alta. Dept. Lands and Forests. Edmonton, Alberta.

Documents range conditions, distribution and population of bighorn sheep and elk herds in the Drummond-Ruby Creek Region of the Coalbranch, in order that some effective management proposals could be outlined.

Subject: RA5 BE2 PD5

Area: B Source: CWSE

EL0172

Stelfox, J.G. 1966.

Deer and elk population, harvests, range conditions and proposed 1966 seasons.

Alta. Fish and Wildl. Div. Edmonton, Alberta.

Documents the populations, species, age and sex composition of the 1965 harvest for elk and deer in northwestern Alberta. Proposes the 1966 harvest season.

Subject: PD5 MF2 MA3

Area: B Source: CWSE AFWE

Webb, R. 1965.

Elk and deer fall and winter aerial surveys.

Fish and Wildl. Div., Alta. Dept. Lands and Forests, Edmonton.

Objectives : a) general reconnaissance to determine hunting season and winter locations of elk, sheep and deer herds, b) to determine the status of some major elk populations in District I with particular emphasis on the Oldman River herd, c) to determine the seasonal distributions of the Oldman River herd in relation to climatic factors, d) to gather sex and age classification data describing District I deer and elk populations.

Subject: PD5 BE2

Area: B Source: AFWL

HABITAT - GENERAL (RA1)

EL0226

Anonymous. 1973.

Land use planning for conservation.

Wildl. Manage. Series, No. 6, Fish and Wildl. Div., Alta. Dept.
Lands and Forests. Edmonton, Alberta.

Briefly discusses a 3 zone 'multiple use' approach to land allocation undertaken by the Alberta government in 1978, and the goals of the Fish and Wildlife Division's habitat management program in relation to this approach. The study areas are all located in Alberta.

Subject: MA6 RA1 Area: A Source: UOCL

EL0020

Boyce, M.S. and L.D. Hayden-Wing Eds. 1979.

North American elk : ecology, behavior and management.
Univ. of Wyoming. Laramie, Wyoming.

An extensive collection of articles dealing with population biology, habitat ecology, behavior, pathology and nutrition, and management of elk in North America.

Subject: RA1 BE1 PD1 MA1 Area: B Source: CWSE

EL0222

Campbell, J.B. et al. 1962.

Range management of grasslands and adjacent parklands in the Prairie provinces.
Dept. Agric. Ottawa, Ontario.

Looks at land usage, and crop production of grazing land in grasslands and adjacent parklands in Alberta and Saskatchewan. Major management issues are discussed as well.

Subject: RA1 MA2 Area: B Source: UOAL

EL0219

Clark, S.E., J.A. Campbell and J.B. Campbell. 1942.

An ecological and grazing capacity study of the native grass pastures in southern Alberta, Saskatchewan and Manitoba.
Technical Bull. #44, Dept. Agriculture. Ottawa, Ontario.

Discusses land usage, crop production and grazing lands, research and environmental monitoring, and carrying capacity of rangelands in southern Alberta, Saskatchewan and Manitoba, Canada. Grasslands management and other major management issues are also discussed.

Subject: RA1 MA2 Area: A Source: UOCL

EL0043

DeByle, N.V. 1979.

Potential effects of stable versus fluctuating elk populations in the alpen ecosystem. In North American elk, ecology and management. p. 13-19.
Univ. Wyoming. Laramie, Wyoming.

Discusses management techniques with respect to normal population fluctuations of elk. The study area was the Gros Ventre drainage, Wyoming.
Subject: MA1 RA1 Area: B Source: KPWL

EL0129

Mussell, D.J. 1982.

Utilization of the Kootenay Plains of western Alberta by ungulates.
Dept. Energy and Nat. Resources, Alta. Prov. Govt. Edmonton, Alberta.

Describes ungulate use of the Kootenay Plains of western Alberta. Methods and techniques are first described in detail, and then the results of present and past habitat use is stated. Included is the ecology of the study area. In light of the results, some proposed regional developments are discussed.
Subject: RA1 RA4 Area: B Source: AFWE

EL0137

Neitfeld, M.T. 1983.

Foraging behavior of wapiti in the boreal mixed-wood forest, central Alberta.
MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Investigates food habits of wapiti with respect to available forage resources. Examines and compares seasonal food habits and foraging behavior in five different habitats, as important to wapiti in the mixed-wood boreal forest region. The study was conducted at the Ministik Wildlife Research Station, Alberta.
Subject: BE4 RA1 BE5 Area: B Source: UAAS

EL0157

Schmidt, J.L. and eds. D.L. Gilbert 1980.

Big game of North America, ecology and management.
Stackpole Books. Harrisburg, Pennsylvania.

A good reference on the ecology and management of the big game of North America. Includes short articles on various animals, and concludes with a series of reports dealing specifically with habitat and management problems.
Subject: BE1 MA1 RA1 PD1 Area: B Source: AFWL AFWE

EL0174

Stelfox, J.G. 1969.

Ungulates as primary consumers.
Lecture presented to : 8th Ann. Regional Park Warden School, May 27, 1969 at Jasper National Park.

Discusses the relationships of wild ungulates to plant associations, and the effects of environmental carrying capacities, seasonal changes in forage nutrition and palatability, and climate on ungulates in the Canadian Rocky Mountains. Some general population distributions are included as well.
Subject: RA1 NP1 RA4 Area: A Source: CWSE

EL0224

Wallis, C. 1980.

Montane, foothills parkland and southwest rivers : natural landscapes survey 1978-79.

Parks Div., Resource Assessment and Management Section. Edmonton, Alberta.

Documents data collected on land use, fauna, flora and landscape characteristics. Previously studied sites and the new study areas were compared from floristic, faunal, geological and landscape viewpoints and ecological values. The study area is the montane and foothills parkland sections of the Rocky Mountain Natural Region from Longview south to the U.S. border.

Subject: RA1 PD1 MA6 Area: A Source: ARPL

COMPETITION AND OVERLAP (RA2)

EL0014

Berg, B.P. 1983.

Wild and domestic ungulate interactions in the Bob Creek Area, southwestern Alberta.

MSc. Thesis, Univ. of Alta. Edmonton, Alberta.

Examines the interactions, patterns, differences and implications of management of resource interactions of elk (*Cervus elaphus nelsoni*), mule deer and cattle in the area around Bob Creek, southwestern Alberta. The types of resource use discussed are: seasonal use, spatial and topographical use, the use of plant communities, diets, environmental selection, and activity and range use. A discussion follows dealing with the resource division among the ungulates. Details of methods used, and management suggestions for grazing are included.

Subject: RA2 BE3 MA2 Area: A Source: LARS

EL0015

Berg, B.P. and R.J. Hudson. 1981.

Elk, mule deer, and cattle : functional interactions on foothills range in southwestern Alberta.

Proc. Wildl.-Livestock Relationships Symp., Couer d'Alene, Idaho. April 20-22, 1981:509-519.

Investigates food habits, use of habitats by elk, mule deer and cattle, and range condition and productivity. The study area was the foothills of southwestern Alberta. Also documents the amount of overlapping resource use between the three species.

Subject: BE4 RA4 RA2 Area: A Source: AFWL

EL0027

Capp, J.C. 1967.

Competition among bighorn sheep, elk and deer in Rocky Mountain National Park, Colorado.

MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Discusses the vegetative composition and climate of the range and the usage,

by various types of ungulates. The seasonal movements and distributions, and occupancy of habitat types, and food preferences for each of sheep, elk and deer in Rocky Mountain National Park, Colorado are given. Competition for range between these three ungulates is analyzed in terms of the above.
 Subject: RA2 BE3 Area: B Source: CWSE

EL0037

Cooperrider, A.Y. and J.A. Bailey. 1981.
 Analysis of competition between domestic livestock and wild ungulates with computer simulation.
 Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:421-440.

Discusses computer simulation for intergrating data on wildlife and domestic animals to predict the degree of competition between two or more ungulates under a given set of environmental conditions. Tests this method using data from a semi-arid range in southern Colorado. An outline of advantages and limitations of simulation modelling is given.
 Subject: RT2 RA2 Area: B Source: AFWL

EL0038

Cowan, I.McT. 1947.
 Range competition between mule deer, bighorn sheep and elk in Jasper Park, Alberta.
 Trans. Twelfth North Amer. Wildl. Conf., San Antonio, Texas. Feb. 3-5, 1947:223-227.

Discusses competition with respect to forage preferences of mule deer, bighorn sheep and elk in Jasper Park, Alberta. Documents types of plants, and the percentage of total food for the animals these plants make up.
 Subject: RA2 RA4 Area: B Source: UOAL

EL0039

Cowan, I.McT. 1950.
 Some vital statistics of big game on overstocked mountain range.
 Trans. Fifteenth North Amer. Wildl. Conf., San Francisco, California. March 6-9, 1950:581-588.

Discusses sex ratios, fertility and effective reproduction of big game animals on overstocked mountain range in Banff, Jasper, Kootenay and Yoho National Parks. Includes a description of range vegetation and utilization.
 Subject: PD4 RA2 BE3 Area: B Source: UOAL

EL0017

D.A., Blood. 1966.
 Range relationships of elk and cattle in Riding Mountain National Park, Manitoba.
 Wildl. Manage. Bull. Series 1, #9., Can. Wildl. Serv. Edmonton, Alberta.

Bulletin is arranged in four sections: (1)Description and ecology, of the study area, (2)the elk population, (3)elk food habits, and (4)elk-cattle competition. The study area is Riding Mountain National Park, Manitoba.
 Subject: RA2 PD2 NP2 Area: B Source: WNPL

EL0046

Eastman, D.S. 1972.

Current knowledge of ungulate competition in southern British Columbia.
 Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29,
 1972:40-51.

Discusses wild-domestic ungulate competition in various regions of southern British Columbia. Gives a list of measurements which must be obtained in order to determine the level of competition. Management suggestions are made to lessen this level of competition.

Subject: RA2 BE4 MA3 Area: B Source: LARS

EL0051

Flook, D.R. 1956.

Range conditions and livestock grazing, Riding Mountain National Park.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines range conditions, livestock grazing, and the effect of these on wildlife in Riding Mountain National Park.

Subject: RA2 RA5 MA2 Area: B Source: CWSE

EL0052

Flook, D.R. 1957.

Elk - horse grazing situation, Ya Ha Tinda Ranch, 1957.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines the grazing situation between elk and domestic horses on the Ya Ha Tinda Ranch during 1957.

Subject: RA2 Area: B Source: CWSE

EL0082

Hudson, R.J. 1977.

Habitat utilization and resource partitioning by wild ruminants : multivariate analysis of nominally-sealed attribute data.
 Northwest Science 51(2):101-110.

Describes how a multivariate nominal scale analysis technique was applied to the study of habitat use and resource partitioning in a western Canadian grazing system. The study area was Premier Ridge, B.C., and the ungulates involved were whitetailed and mule deer, elk, and bighorn sheep.

Subject: RT2 RA2 BE3 Area: B Source: LARS

EL0081

Hudson, R.J. 1972.

Integrated use of grazing resources.
 Proc. Informal Work Planning Meeting, Kamloops, B.C. Sept. 28-29,
 1972:21-31.

Discusses factors influencing the interactions of domestic and wild ungulates, and how to organize management procedures which would reduce the competition among animals, in light of these factors.

Subject: MA2 RA2 BE3 BE4 Area: B Source: LARS

EL0083

- Hudson, R.J. and V.C. Brink. 1976.
Occupational patterns of wildlife on a major East Kootenay winter-spring range.
J. Range Manage. 29(1):38-43.
- Investigates range vegetation and domestic livestock as being important factors in the distributions and range usages of deer, elk and bighorn sheep. Methods of observation were discussed. The study area was Premier Ridge, British Columbia.
- Subject: RA2 BE3 Area: B Source: CWSE

EL0084

- Hudson, R.J., W.D. Kitts and V.C. Brink. 1972.
Habitat utilization by wildlife and livestock in the southern Rocky Mountain Trench, British Columbia.
Environment Canada. Edmonton, Alberta.
- Discusses habitat use by cattle, deer, elk and bighorn sheep in the southern Rocky Mountain Trench in British Columbia. Range production and utilization, habitat, competition, nutrition, and some techniques used for the study are included.
- Subject: BE3 RT2 RA2 RA4 Area: B Source: CWSE

EL0088

- Jones, W.B. 1965.
Response of major plant species to elk and cattle grazing in northwestern Wyoming.
J. Range Manage. 18(4):218-220.
- Studied the difference between elk range, cattle range, and ungrazed range in northwestern Wyoming.
- Subject: RA2 MA2 BE3 Area: B Source: UABA

EL0235

- Komberec, T.J. 1976.
Range relationships of mule deer, elk and cattle in a rest rotation grazing system during winter and spring.
MSc. Thesis, Montana State Univ. Montana.
- Looks at the range relationships of mule deer, elk and cattle in Phillips County, Missouri River Basin, Montana. Study period was from July 1974 to December 1975.
- Subject: RA2 BE4 Area: B Source: DIAL

EL0104

- Long, A.J. and L.L. Irwin. 1981.
Elk - cattle interactions in the Bighorn Mountains, Wyoming.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22. 1981:553-564.
- Studies the relationship between cattle and elk near Tensleep, Wyoming. Determines the habitat preferences of elk and cattle, and relates these to forage characteristics (i.e. species composition, forage availability, etc.). Also discusses various factors influencing fluctuation in nutrient levels.
- Subject: BE3 RT2 RA2 Area: B Source: AFWL

EL0112

Mackie, R.J. 1965.

Range ecology and relations of mule deer, elk, and cattle in the Missouri River breaks, Montana.

PhD. Thesis, Montana State College. Bozeman, Montana.

Describes differences and similarities in habitat selection and range use competition between elk, mule deer, and cattle in the Missouri River breaks, Montana. Relates ungulate temporal and spatial distribution, and forage preferences to composition, abundance and intensity of range forage.

Subject: RA2 BE3 RA4 Area: B Source: LARS

EL0132

McIntosh, B.J. and P.R. Krausman. 1981.

Elk and mule deer distributions after a cattle introduction in northern Arizona.

Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:545-552.

During the time period from June, 1979 to Nov. 1980, this study was done to test whether or not the introduction of cattle onto a grazing area of mule deer and elk would effect the ungulate distributions. The distributions and movements of the deer and elk were tested one year prior to, and one year after the cattle were introduced. The study area was the Circle-Bar Pasture, in northern Arizona. Methodology was discussed in some detail.

Subject: BE4 RA2 RT2 Area: B Source: AFWL AFWE

EL0119

Miller, R.F. and M. Vavra. 1981.

Deer, elk and cattle diets in northeastern Oregon rangelands.

Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:500-508.

Summarizes diet information for elk, cattle and deer, obtained from four studies in the Blue Mountains, and the Wallowa Mountains in northeastern Oregon. The diets of the deer and elk are covered for winter, spring and summer, while the cattle are investigated from late June until early October.

Subject: NP2 RA2 Area: B Source: AFWL

EL0118

Miller, R.F., W.C. Krueger and M. Vavra. 1981.

Deer (*Odocoileus hemionus hemionus*) and elk (*Cervus canadensis nelsoni*) use on the foothill rangelands in northern Oregon, U.S.A.

J. Range Manage. 34(3):201-204.

Examines range usage by deer and elk in the Wallowa Mountains in north-eastern Oregon. Also discusses the reliability of pellet group counts as a method of determining forage use.

Subject: RA4 RT4 RA2 Area: B Source: UABA

EL0123

Morris, M.S. 1956.

Elk and livestock competition.

J. Range Manage. 9(1):10 ff.

Discusses food and range requirements of elk and livestock, economic aspects of the problem of elk and livestock competition, and various elk management

considerations for Montana. The general distributions of the animals are included.

Subject: BE4 RA2 MA4 Area: B Source: CWSE

EL0138

Nelson, J.R. and D.G. Burnell.
Elk-cattle competition in central Washington.
Washington State Univ. Pullman, Washington.

Reviews factors influencing elk-cattle competition in central Washington. Some factors are diet similarity, availability, animal distribution patterns, timing and social interaction. Discusses a new analytical method used to correlate the data.

Subject: RA2 BE4 RT2 Area: B Source: LARS

EL0140

Oldemeyer, J.L. 1966.
Winter ecology of bighorn sheep in Yellowstone National Park.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Although primarily concerned with sheep, this dissertation presents a lengthy discussion on elk competition with the bighorn sheep of this area.

Subject: RA2 BE3 Area: B Source: ANNB

EL0149

Reid, L.D. 1973.
Diet similarity between mule deer, elk and cattle in south-central Colorado.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Discusses range relationships, interspecific competition and forage preferences for mule deer, elk and cattle, and the factors which influence the magnitude of these relationships. The study area is south-central Colorado. Included is an extensive literature review on this subject.

Subject: BE3 BE4 RA2 NP2 Area: B Source: LARS

EL0150

Reid, L.D. and R.M. Hansen. 1973.
Diets of elk, deer, and cattle near Fort Garland, Colorado.
Colorado State Univ. Expt. Station. Fort Collins, Colorado.

Gives an account for the overlap percentages of range plants that are divided between elk and deer, and between deer, elk and cattle on range used only in the summer by cattle. The study was conducted near Fort Garland, Colorado.

Subject: NP2 RA2 Area: B Source: LARS

EL0154

Roberts, H.B. and K.G. Becker. 1981.
Managing central Idaho rangelands for livestock and elk.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:537-543.

Discusses summer habitat conditions for elk in central Idaho. Looks at competition for forage and space with grazing livestock in that area. Recommendations for management are included.

Subject: RA2 RA5 MA2

Area: B

Source: AFWL

EL0156

Schallenberger, A.
The Sun River Game Preserve.
Montana Outdoors.

Gives a general description of elk and bighorn sheep competition, elk hunting, and management procedures for elk on the Sun River Game Preserve, Montana.

Subject: RA2 MF2 MA2

Area: B

Source: CWSE

EL0163

Skovlin, J.M., P.J. Edgerton and B.R. McConnell. 1983.
Elk use of winter range as affected by cattle grazing, fertilizing and burning in southeastern Washington.
J. Range Manage. 36(2):184-189.

Outlines a study, and the methods used, to determine how cattle grazing, fertilizing and burning affects elk (*Cervus elaphus nelsoni*) winter range usage in southeastern Washington.

Subject: RA2 RA4 RA7

Area: B

Source: UOAL

EL0162

Skovlin, J.M., P.J. Edgerton and R.W. Harris. 1968.
The influence of cattle management on deer and elk.
23'rd North Amer. Wildl. Conf, March 11-13, 1968:169-181.

Studies the relationship between big game and cattle range usage in the Blue Mountains of Oregon and Washington. Looks into the reasons behind the differing yearly and seasonal use. Methods used are outlined in detail.

Subject: MA2 RA2 RT3 BE3

Area: B

Source: LARS UOAL

EL0164

Smith, A.D. and D.D. Doell. 1968.
Guides to allocating forage between cattle and big game on big game winter range.
Pub. #68-11, Utah State Div. Fish and Game.

Looks at range utilization during different seasons, and big game-cattle forage competition in Utah. Determines seasonal, and the intensity of, range use by cattle which minimizes grazing on woody plants and still allows full utilization of the herbaceous species.

Subject: RA3 RA2 MA2

Area: B

Source: LARS

EL0165

Snyder, R.O. 1966.
Forage competition between cattle and elk in the Gird Creek Drainage of western Montana.
MSc. Thesis, Univ. of Montana. Missoula, Montana.

Determines the extent of the actual and potential forage competition between cattle and elk in the Gird Creek Drainage in western Montana. Looks at food preferences and nutrition of elk and cattle, and describes forage of the study area. The study techniques used are outlined in detail.

Subject: NP2 RA2 RT3

Area: B

Source: CWSE

EL0180

Stevens, D.R. 1966.

Range relationships of elk and livestock, Crow Creek Drainage, Montana.
J. Wildl. Manage. 30(2):349-363.

Examines the range relationship between elk (*Cervus canadensis*), cattle and sheep of the Crow Creek Drainage, Montana. The study period was 1963-1964, with the area studied covering 100,000 acres. Competition and usage between species was outlined.

Subject: RA2 BE3

Area: B

Source: UABA

EL0186

Tanner, H.C. 1950.

Investigation into the competition between elk and big-horned sheep in the Cascade Valley, Banff National Park, 1950.
Can. Wildl. Serv. Edmonton, Alberta.

Documents the condition of the alpine meadows in the Cascade Valley, and discusses competition between elk and bighorn sheep in that area with respect to range utilization.

Subject: RA2 RA4 RA5

Area: B

Source: CWSE

EL0195

Urness, P.J. 1981.

Livestock as tools for managing big game winter range in the intermountain west.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:20-31.

Investigates the positive aspects of wild and domestic ungulate interactions. Focuses specifically on the use of livestock for managing big game winter ranges. Outlines studies done using cattle, sheep and horses on ungulate winter range.

Subject: RA2 MA2

Area: B

Source: AFWL AFWE

EL0201

Ward, A.L., Cupal Lea Oakley and Weeks. 1973.

Elk behavior in relation to cattle grazing, forest recreation, and traffic.
Trans. North Amer. Wildl. Conf. 38:327-337.

Investigates the alteration of elk behavior due to traffic, forest recreation and cattle grazing in the Medicine Bow north forest, Wyoming. Study period covered April 28 to October 8, 1971.

Subject: BE6 RA2

Area: B

Source: UOAL

EL0211

Woolf, A. 1968.

Summer ecology of bighorn sheep in Yellowstone National Park.
MSc. Thesis, Colorado State Univ. Fort Collins, Colorado.

Documents the problem of competition between sheep and elk in Yellowstone National Park. The dominant plant and staple foods of both species are discussed.

Subject: RA2 BE3 NP2

Area: B

Source: ANNB

CRITICAL AND SEASONAL RANGES (RA3)

EL0151

Anonymous. 1971.

Elk census 1971, Waterton Lakes National Park.

Warden Serv. Waterton Lakes National Park, Alberta.

Documents migrational trend, winter utilization of range, and population density of elk on Stony Flats, Waterton Lakes National Park. Some management recommendations are included.

Subject: PD5 BE2 RA3

Area: A

Source: WNPL

EL0102

Leege, T.A., M.W. Schlegel and T.J. Hershey. 1976.

Elk ecology.

Idaho Dept. of Fish and Game, Project W-160-R-3. Idaho.

This project is divided into nine separate studies : Range rehabilitation, spring vs fall burning for range, ecological study, population dynamics and movements of the Loscha elk herd, immobilizing equipment and new drugs, range improvement through vegetal manipulation, elk research projects, and description of habitat needs of elk during different seasons. The study area is along the slopes of Fish Creek in the Loscha River drainage, Idaho.

Subject: MA2 BE3 RA3

Area: B

Source: CWSE

EL0146

Peek, J.M. and A.L. Lovaas. 1968.

Differential distribution of elk by sex and age on the Gallatin winter range, Montana.

J. Wildl. Manage. 32(3):553-557.

Documents the distributions of elk (*Cervus canadensis*) by sex and age on the Gallatin elk winter range in Montana from 1958 to 1963.

Subject: BE2 RA3

Area: B

Source: UOAL

EL0164

Smith, A.D. and D.D. Doell. 1968.

Guides to allocating forage between cattle and big game on big game winter range.

Pub. #68-11. Utah State Div. Fish and Game.

Looks at range utilization during different seasons, and big game-cattle forage competition in Utah. Determines seasonal, and the intensity of, range use by cattle which minimizes grazing on woody plants and still allows full utilization of the herbaceous species.

Subject: RA3 RA2 MA2

Area: B

Source: LARS

RANGE PRODUCTION, UTILIZATION AND QUALITY (RA4)

EL0011

Barmore, W.J., Jr. 1965.
 Aspen - elk relationships on the northern Yellowstone winter range. Yellowstone National Park, Wyoming.
 Western Assoc. Fish and Game Comm. Elk Workshop, Bozeman, Montana. March 2-4, 1965.

Discusses the problem of overgrazing on aspen by elk in Yellowstone National Park. Looks at management techniques which might restore the balance between elk and aspen.

Subject: RA4 MA2 MA3

Area: B

Source: CWSE

EL0015

Berg, B.P. and R.J. Hudson. 1981.
 Elk, mule deer, and cattle : functional interactions on foothills range in southwestern Alberta.
 Proc. Wildl.-Livestock Relationships Symp., Couer d'Alene, Idaho. April 20-22, 1981:509-519.

Investigates food habits, use of habitats by elk, mule deer and cattle, and range condition and productivity. The study area was the foothills of southwestern Alberta. Also documents the amount of overlapping resource use between the three species.

Subject: BE4 RA4 RA2

Area: A

Source: AFWL

EL0016

Black, H., R.J. Scherzinger and J.W. Thomas. 1975.
 Relationships of Rocky Mountain elk and Rocky Mountain mule deer habitat to timber management in the Blue Mountains of Oregon and Washington.
 Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec. 16-17, 1975: 11-31.

Discusses the consequences of timber management decisions on potential for deer and elk use, by land type. Makes recommendations which will help in optimizing elk habitat in areas subject to roading and timber management.

Subject: RA4 MA4

Area: B

Source: AFWL

EL0196

Camp, J. and Van E.S. Telfer. 1974.
 Browse yield and use by ungulates in Elk Island National Park, 1973-1974.
 Can. Wildl. Serv. Edmonton, Alberta.

This report presents the results of a remeasurement of transects established at Elk Island National Park in 1972 to monitor the trend of the yield and utilization of woody browse. Also discusses management procedures for range and ungulates, to deal with problems discovered during the study.

Subject: RA4 RA5 MA2

Area: B

Source: WNPL

EL0035

Constan, K. 1967.

Bighorn sheep range use, food habits and relationships to mule deer and elk in Gallatin Canyon.
Big Game Research, Montana Fish and Game Dept. Montana.

Detailed description of range use, food habits and interspecific relationships of bighorn sheep, mule deer and elk. Some research techniques were also included. The study was conducted in Gallatin Canyon, in southwestern Montana.

Subject: RA4 BE4 NP2 Area: B Source: CWSE

EL0036

Constan, K.J. 1972.

Winter foods and range use of three species of ungulates.
J. Wildl. Manage. 36(4):1068-1076.

Documents range usage, food habits, population characteristics and interspecific relationships of bighorn sheep, mule deer, and elk on the Deer Creek-Asbestos Creek winter-spring range in Gallatin Canyon, southwestern Montana.

Subject: BE4 NP2 RA4 Area: B Source: UOAL

EL0038

Cowan, I.McT. 1947.

Range competition between mule deer, bighorn sheep and elk in Jasper Park, Alberta.

Trans. Twelfth North Amer. Wildl. Conf., San Antonio, Texas. Feb. 3-5, 1947:223-227.

Discusses competition with respect to forage preferences of mule deer, bighorn sheep and elk in Jasper Park, Alberta. Documents types of plants, and the percentage of total food for the animals these plants make up.

Subject: RA2 RA4 Area: B Source: UOAL

EL0044

Demarchi, D.A. 1971.

Ecology of big game winter ranges in the southern Rocky Mountain Trench, East Kootenay region.

Wildl. Manage. Div., B.C. Fish and Wildl. Branch. Victoria, British Columbia.

Describes in detail the condition, utilization, quality, and floral phenology of the big game winter ranges in the East Kootenay region of British Columbia. Includes a discussion of the effects of the flooding of the Libby Reservoir, and possible livesock reductions in that area.

Subject: RA4 RA5 RA6 MA2 Area: A Source: CWSE

EL0049

Flook, D.R. 1955.

Appraisal of the elk situation, Waterton Lakes National Park, October, 1955.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines the winter range conditions of the three herds of elk within Waterton Lakes National Park, Alberta. Gives details of the numbers of elk spotted during the study, and plant composition of the range. Management objectives are included.

Subject: RA4 RA5 MA2

Area: A

Source: CWSE

EL00225

Geist, D.A. 1975.

Risk zoning : a recreation management system and method of measuring carrying capacity.
J. Forestry 73(11):711-714.

Studies the carrying capacity of land in western Canada and the U.S. Relates the land usage to recreation and developments. Discusses major management issues dealing with this, as well.

Subject: RA4 MA6

Area: A

Source: UOAL

EL0063

Gordon, F.A. 1968.

Range relationships of elk and cattle on elk winter range, Crow Creek, Montana.
Big Game Research Project, State of Montana.

Studies food habits, range distribution, forage utilization, and interspecific relationships of elk and cattle from 1967-1969 on the Crow Creek Drainage, Montana. Some history of elk and cattle usage was given as well as a description of the physiography and vegetation.

Subject: RA4 BE4 NP2

Area: B

Source: AFWL

EL0074

Hanley, T.A. 1982.

Cervid activity patterns in relation to foraging constraints : western Washington.
Northwest Science 56(3):208-217.

Relates foraging group size and temporal, spatial patterns activity to seasonal changes in forage availability and quality. Specifically studied reproductive female Rocky Mountain elk and black-tailed deer.

Subject: BE5 RA4

Area: B

Source: LARS

EL0084

Hudson, R.J., W.D. Kitts and V.C. Brink. 1972.

Habitat utilization by wildlife and livestock in the southern Rocky Mountain Trench, British Columbia.
Environment Canada. Edmonton, Alberta.

Discusses habitat use by cattle, deer, elk and bighorn sheep in the southern Rocky Mountain Trench in British Columbia. Range production and utilization, habitat, competition, nutrition, and some techniques used for the study are included.

Subject: BE3 RT2 RA2 RA4

Area: B

Source: CWSE

EL0089

Julander, O. and D.E. Jeffrey. 1964.

Deer, elk and cattle range relations on summer range in Utah.
Trans. North Amer. Wildl. Nat. Resources Conf. 29:404-414.

Discusses range utilization and forage preferences for deer, elk and cattle on the Willow Creek range, Utah.

Subject: RA4 BE3 NP2

Area: B

Source: UABA

EL0093

Kirsch, J.B. 1962.

Range use, relationship to logging, and food habits of the elk in the Little Belt Mountains, Montana.

MSc. Thesis, Montana State College. Bozeman, Montana.

Investigates distribution, movement, range use, food habits, and the relationships to block clear cut logging of lodgepole pine of elk in the Little Belt Mountains in Montana. Relates elk movements and range use to broadly designated plant communities, and correlates size, age, and moisture conditions of the pine clear cuts with elk usage. Outlines a vegetational analysis of two clear cuts and the uncut lodgepole to compare changes resulting from logging.

Subject: BE3 RA4 MA4

Area: C Source: CWSE

EL0098

Knowles, C.J. and R.B. Campbell. 1981.

Distribution of elk and cattle in a rest-rotation grazing system.

Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:47-60.

Discusses the distributional relationships of elk and cattle in a rest-rotation grazing system in the Missouri River breaks of north-central Montana. The study was conducted in the period from 1973 to 1976.

Subject: BE4 RA4 MA2 BE2

Area: B Source: AFWL

EL0218

Lord, T.M. and J.I. Sneddon. 1974.

Soils and wildlife management.

Canada Agric. 19(1):22-23.

Discusses the problem of over-grazing by domestic livestock with respect to wildlife range depletion.

Subject: RA4 RA5

Area: A Source: AFWL

EL0109

Lyon, L.J. and C.E. Jensen. 1980.

Management implications of elk and deer use of clear-cuts in Montana.

J. Wildl. Manage. 44(2):352-362.

Discusses a study investigating the use of clear-cuts by elk (*Cervus elaphus nelsoni*), mule deer and white-tailed deer in Montana. Reasons for various usage patterns are outlined, as well as the methods used to discover these.

Subject: RA4 MA4

Area: B Source: LARS

EL0112

Mackie, R.J. 1965.

Range ecology and relations of mule deer, elk, and cattle in the Missouri River breaks, Montana.

PhD. Thesis, Montana State College. Bozeman, Montana.

Describes differences and similarities in habitat selection and range use competition between elk, mule deer, and cattle in the Missouri River breaks, Montana. Relates ungulate temporal and spatial distribution, and forage preferences to composition, abundance and intensity of range forage.

Subject: RA2 BE3 RA4

Area: B Source: LARS

EL0113

Mair, W.W. 1952.
The impact of an introduced population of elk upon the biota of Banff National Park.
M.A. Thesis, Univ. of B.C. Vancouver, British Columbia.

Detailed investigation into elk movements, food habits, range usage, and wildlife interactions in Banff National Park, Alberta.

Subject: RA4 BE4 NP2 PD2 Area: B Source: CWSE

EL0118

Miller, R.F., W.C. Krueger and M. Vavra. 1981.
Deer (*Odocoileus hemionus hemionus*) and elk (*Cervus canadensis nelsoni*) use on the foothill rangelands in northern Oregon, U.S.A.
J. Range Manage. 34(3):201-204.

Examines range usage by deer and elk in the Willowa Mountains in northeastern Oregon. Also discusses the reliability of pellet group counts as a method of determining forage use.

Subject: RA4 RT4 RA2 Area: B Source: UABA

EL0120

Milner, B.J. 1977.
Vegetation analysis of ungulate range exclosures, Elk Island National Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Documents the vegetation of four woodland and one grassland range exclosure at Elk Island National Park, Alberta. Looks at the effect of ungulate use on the rate of browse growth. The methodology was discussed in detail.

Subject: RA4 RT3 Area: B Source: WNPL

EL0124

Morris, M.S. and J.E. Schwartz. 1957.
Mule deer and elk food habits on the National Bison Range.
J. Wildl. Manage. 21(2):189-193.

Discusses the forage preferences and the range vegetation of mule deer and elk on the National Bison Range, Montana. Methods used were sample plot range determinations and stomach analysis of the animals.

Subject: RA4 NP2 RT3 Area: B Source: CWSE

EL0129

Mussell, D.J. 1982.
Utilization of the Kootenay Plains of western Alberta by ungulates.
Dept. Energy and Nat. Resources, Alta. Prov. Govt. Edmonton, Alberta.

Describes ungulate use of the Kootenay Plains of western Alberta. Methods and techniques are first described in detail, and then the results of present and past habitat use is stated. Included is the ecology of the study area. In light of the results, some proposed regional developments are discussed.

Subject: RA1 RA4 Area: B Source: AFWE

EL0163

- Skovlin, J.M., P.J. Edgerton and B.R. McConnell. 1983.
 Elk use of winter range as affected by cattle grazing, fertilizing and burning in southeastern Washington.
 J. Range Manage. 36(2):184-189.

Outlines a study, and the methods used, to determine how cattle grazing, fertilizing and burning affects elk (*Cervus elaphus nelsoni*) winter range usage in southeastern Washington.

Subject: RA2 RA4 RA7 Area: B Source: UOAL

EL0169

- Stelfox, J.G. 1961.
 Effects of harvesting coniferous forests in western Alberta on big game.
 Alta. Fish and Wildl. Edmonton, Alberta.

This paper deals with a study on plant species, numbers, canopy coverage, browse forage yields and heights, utilization, seasonal big game numbers and distribution in a mature white spruce forest and during the first five plant successional years. Logged over areas that have been scarified are compared to unscarified areas. Study area is located near Hinton, Alberta. Relates how harvesting coniferous forests effect big game.

Subject: RA4 BE2 MA4 Area: B Source: CWSE

EL0173

- Stelfox, J.G. 1968.
 Condition of elk wintering range along Stony Flats, Waterton Lakes National Park.
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Detailed report on the condition and usage of the elk wintering range along Stony Flats, Waterton Lakes National Park.

Subject: RA4 RA5 Area: A Source: CWSE

EL0174

- Stelfox, J.G. 1969.
 Ungulates as primary consumers.
 Lecture presented to : 8'th Ann. Regional Park Warden School, May 27, 1969 at Jasper National Park.

Discusses the relationships of wild ungulates to plant associations, and the effects of environmental carrying capacities, seasonal changes in forage nutrition and palatability, and climate on ungulates in the Canadian Rocky Mountains. Some general population distributions are included as well.

Subject: RA1 NP1 RA4 Area: A Source: CWSE

EL0186

- Tanner, H.C. 1950.
 Investigation into the competition between elk and big-horned sheep in the Cascade Valley, Banff National Park, 1950.
 Can. Wildl. Serv. Edmonton, Alberta.

Documents the condition of the alpine meadows in the Cascade Valley, and discusses competition between elk and bighorn sheep in that area with respect to range utilization.

Subject: RA2 RA4 RA5 Area: B Source: CWSE

EL0227

Weatherwill, R.G. and L.B. Keith. 1969.

The effects of livestock grazing on an aspen forest community.
 Fish and Wildl. Div., Alta. Dept. Lands and Forests. Edmonton,
 Alberta.

Discusses how livestock grazing effects aspen forest communities with respect to
 land usage, crop production, and flora and fauna.

Subject: RA4 MA2 Area: B Source: UOCL

RANGE CONDITION AND TREND (RA5)

EL0238

Boyd, R.J. 1970.

Elk of the White River Plateau, Colorado.

Tech. Pub. 25, Colorado Game, Fish and Parks Dept. Colorado.

Gives browse conditions on both summer and winter ranges in the White
 River Basin, Colorado, ten to fifteen years after high spruce kill from beetles.

Subject: RA5 Area: B Source: DIAL

EL0196

Camp, J. and Van E.S. Telfer. 1974.

Browse yield and use by ungulates in Elk Island National Park, 1973-1974.

Can. Wildl. Serv. Edmonton, Alberta.

This report presents the results of a remeasurement of transects established at
 Elk Island National Park in 1972 to monitor the trend of the yield and
 utilization of woody browse. Also discusses management procedures for range
 and ungulates, to deal with problems discovered during the study.

Subject: RA4 RA5 MA2 Area: B Source: WNPL

EL0044

Demarchi, D.A. 1971.

Ecology of big game winter ranges in the southern Rocky Mountain Trench,
 East Kootenay region.

Wildl. Manage. Div., B.C. Fish and Wildl. Branch. Victoria, British
 Columbia.

Describes in detail the condition, utilization, quality, and floral phenology of
 the big game winter ranges in the East Kootenay region of British Columbia.
 Includes a discussion of the effects of the flooding of the Libby Reservoir,
 and possible livestock reductions in that area.

Subject: RA4 RA5 RA6 MA2 Area: A Source: CWSE

EL0050

- Flook, D.R. 1955.
An appraisal of the elk situation in the Athabasca Valley of Jasper Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Describes the elk range vegetation in the Athabasca Valley, Jasper Park, Alberta. Management recommendations are then outlined in view of the overcrowded and generally poor range conditions.

Subject: RA5 MA2 Area: B Source: CWSE

EL0051

- Flook, D.R. 1956.
Range conditions and livestock grazing, Riding Mountain National Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines range conditions, livestock grazing, and the effect of these on wildlife in Riding Mountain National Park.

Subject: RA2 RA5 MA2 Area: B Source: CWSE

EL0049

- Flook, D.R. 1955.
Appraisal of the elk situation, Waterton Lakes National Park, October, 1955.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Outlines the winter range conditions of the three herds of elk within Waterton Lakes National Park, Alberta. Gives details of the numbers of elk spotted during the study, and plant composition of the range. Management objectives are included.

Subject: RA4 RA5 MA2 Area: A Source: CWSE

EL0218

- Lord, T.M. and J.I. Sneddon. 1974.
Soils and wildlife management.
Canada Agric. 19(1):22-23.

Discusses the problem of over-grazing by domestic livestock with respect to wildlife range depletion.

Subject: RA4 RA5 Area: A Source: AFWL

EL0141

- Oldemeyer, J.L., V.H. Reid and D.A. Nickey. 1981.
Evaluation of rest-rotation grazing in the Missouri River breaks on the Charles M. Russell National Wildlife Refuge, Montana.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:32-46.

Documents a study done to evaluate the vegetative differences between three grazing treatments after twelve years in a four year rest-rotation grazing system for cattle in the Missouri River breaks, Montana.

Subject: MA2 RA5 Area: B Source: AFWL

EL0143

Ormiston, J.H. 1968.

Big game survey and investigations - High Rye elk winter range.
Wildl. Investigations, Project W-73-R-10, State of Montana. Helena, Montana.

Objectives of this study were to gain data on range trend and condition. This was then used to evaluate past and present elk densities and distributions. Future management considerations were then discussed, using the data as criterion. The study area is the High Rye elk winter range in Montana.

Subject: RA5 BE2 Area: B Source: AFWL

EL0154

Roberts, H.B. and K.G. Becker. 1981.

Managing central Idaho rangelands for livestock and elk.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:537-543.

Discusses summer habitat conditions for elk in central Idaho. Looks at competition for forage and space with grazing livestock in that area. Recommendations for management are included.

Subject: RA2 RA5 MA2 Area: B Source: AFWL

EL0171

Stelfox, J.G. 1964.

Bighorn ecological study in the Coalbranch Region (Drummond Creek south to Ruby Creek).
Fish and Wildl. Div., Alta. Dept. Lands and Forests. Edmonton, Alberta.

Documents range conditions, distribution and population of bighorn sheep and elk herds in the Drummond-Ruby Creek Region of the Coalbranch, in order that some effective management proposals could be outlined.

Subject: RA5 BE2 PD5 Area: B Source: CWSE

EL0173

Stelfox, J.G. 1968.

Condition of elk wintering range along Stony Flats, Waterton Lakes National Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Detailed report on the condition and usage of the elk wintering range along Stony Flats, Waterton Lakes National Park.

Subject: RA4 RA5 Area: A Source: CWSE

EL0186

Tanner, H.C. 1950.

Investigation into the competition between elk and big-horned sheep in the Cascade Valley, Banff National Park, 1950.
Can. Wildl. Serv. Edmonton, Alberta.

Documents the condition of the alpine meadows in the Cascade Valley, and discusses competition between elk and bighorn sheep in that area with respect to range utilization.

Subject: RA2 RA4 RA5 Area: B Source: CWSE

EL0188

Telfer, E.S. 1974.
 Vertical distribution of cervid and snowshoe hare browsing.
 J. Wildl. Manage. 38(4):944-946.

Describes a study done in southwestern Alberta on the vertical range over which browsing mammals feed. Animals studied were moose, elk, deer and cattle. Discusses the importance of this information in planning range surveys.
 Subject: RA5 BE5 Area: A Source: UOAL

FLORAL PHENOLOGY AND CLIMATE (RA6)

EL0044

Demarchi, D.A. 1971.
 Ecology of big game winter ranges in the southern Rocky Mountain Trench, East Kootenay region.
 Wildl. Manage. Div., B.C. Fish and Wildl. Branch. Victoria, British Columbia.

Describes in detail the condition, utilization, quality, and floral phenology of the big game winter ranges in the East Kootenay region of British Columbia. Includes a discussion of the effects of the flooding of the Libby Reservoir, and possible livesock reductions in that area.
 Subject: RA4 RA5 RA6 MA2 Area: A Source: CWSE

HABITAT MANIPULATION AND REHABILITATION (RA7)

EL0008

Anderson, E.W. and R.J. Scherzinger. 1975.
 Improving quality of winter forage for elk by cattle grazing.
 J. Range Manage. 28(2):120-125.

Discusses the results of a resource management plan which was put into effect in 1964 and involved various range improvements, and a cattle grazing system designed to increase forage quality for wintering Rocky Mountain elk. The study was carried out on the Bridge Creek Wildlife Management Area in northeastern Oregon.
 Subject: MA2 RA7 Area: B Source: AFWL

EL0247

Boltz, M.J. 1979.
Impacts of prescribed burns and clearcuts upon summer elk food habits, diet quality, and distribution in central Washington.
M.Sc. Thesis, Washington State Univ.

Evaluated impacts of prescribed burns on elk distributions, food habits and diet quality in upper Naneum Creek, Kittitas County, Washington. Seasonal trend in elk habitat use were related to phenology and utilization-induced habitat changes.

Subject: BE6 RA7 MA4 NP2 Area: B Source: UOAL

EL0099

Kufeld, R.C. 1977.
Improving Gambel Oak ranges for elk and mule deer by spraying with 2,4,5-TP.
J. Range Manage. 30(1):53-57.

Discusses the effectiveness of spraying Gambel Oak ranges with 2,4,5-TP. Evaluates the effects on plant abundance, and deer and elk use two and five years after treatment. The study area is northwestern Colorado.

Subject: RA7 Area: B Source: UOAL

EL0101

Leege, T.A. and W.O. Hickey. 1967.
Loscha elk study.
Idaho Fish and Game Project W85-R-18, Job #8. Idaho.

Studies the management technique of spring burning, and compares it to fall burning for range rehabilitation. A Pete King range study was also documented which determined what range is used by elk under different snow and weather conditions during winter months. The study was conducted along the Loscha River, Idaho.

Subject: MA2 RA7 Area: B Source: WNPL

EL0107

Lyon, L.J. 1976.
Elk use as related to characteristics of clearcuts in western Montana.
Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec., 1976:69-72.

Investigates clearcuts of various sizes and locations on elk summer ranges in western Montana, to determine amount of elk usage using pellet group counts. Includes a table of various independent variables associated with the clearcut openings (i.e. cover quality of adjacent forage, nearest vehicle access, and so on.).

Subject: RA7 MA4 Area: B Source: AFWL

EL0142

Orme, M.L. and D.P. Ragain. 1981.
Livestock and big game summer forage following logging in north Idaho.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:607-614.

Documents the results of a study conducted to analyze summer forage in early successional stages of reforestation on the Avery Ranger District, Idaho Panhandle National Forests. Gives quantitative data on available forage

produced in six habitat types within the region. Discussion on the use of this forage for livestock and/or big game animals is included.
 Subject: MA2 MA4 RA7 Area: B Source: AFWL

EL0152

Reynolds, H.G. 1966.

Use of openings in spruce-fir forests of Arizona by elk, deer and cattle.
 Forest Serv., U.S. Dept. of Agric. Arizona.

Documents elk, deer and cattle usage of natural and created openings on spruce-fir forests in the Burro Mountains, the White Mountains, and the Kaibab Plateau of Arizona.
 Subject: RA7 BE3 Area: B Source: CWSE

EL0163

Skovlin, J.M., P.J. Edgerton and B.R. McConnell. 1983.

Elk use of winter range as affected by cattle grazing, fertilizing and burning in southeastern Washington.
 J. Range Manage. 36(2):184-189.

Outlines a study, and the methods used, to determine how cattle grazing, fertilizing and burning affects elk (*Cervus elaphus nelsoni*) winter range usage in southeastern Washington.
 Subject: RA2 RA4 RA7 Area: B Source: UOAL

EL0198

Walker, D. and Assoc. Ltd. 1980.

Assessment of the Ya Ha Tinda Ranch elk winter range improvement by re-seeding study.
 Fish and Wildl. Div., Alta. Energy and Natural Resources. Edmonton, Alberta.

Outlines the condition, climate, vegetation and grazing history of the elk winter range at the Ya Ha Tinda Ranch, Alberta. There is a detailed discussion of the success and efficiency of the study methods used. Management considerations are given as well.
 Subject: RA7 RT3 Area: B Source: WNPL

RESEARCH TECHNIQUES (RT1)**ECOLOGICAL OVERLAP (RT2)**

EL0037

Cooperrider, A.Y. and J.A. Bailey. 1981.

Analysis of competition between domestic livestock and wild ungulates with computer simulation.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April 20-22, 1981:421-440.

Discusses computer simulation for integrating data on wildlife and domestic animals to predict the degree of competition between two or more ungulates under a given set of environmental conditions. Tests this method using data from a semi-arid range in southern Colorado. An outline of advantages and limitations of simulation modelling is given.

Subject: RT2 RA2 Area: B Source: AFWL

EL0082

Hudson, R.J. 1977.

Habitat utilization and resource partitioning by wild ruminants : multivariate analysis of nominally-sealed attribute data.
Northwest Science 51(2):101-110.

Describes how a multivariate nominal scale analysis technique was applied to the study of habitat use and resource partitioning in a western Canadian grazing system. The study area was Premier Ridge, B.C., and the ungulates involved were whitetailed and mule deer, elk, and bighorn sheep.

Subject: RT2 RA2 BE3 Area: B Source: LARS

EL0084

Hudson, R.J., W.D. Kitts and V.C. Brink. 1972.

Habitat utilization by wildlife and livestock in the southern Rocky Mountain Trench, British Columbia.
Environment Canada. Edmonton, Alberta.

Discusses habitat use by cattle, deer, elk and bighorn sheep in the southern Rocky Mountain Trench in British Columbia. Range production and utilization, habitat, competition, nutrition, and some techniques used for the study are included.

Subject: BE3 RT2 RA2 RA4 Area: B Source: CWSE

EL0104

- Long, A.J. and L.L. Irwin. 1981.
Elk - cattle interactions in the Bighorn Mountains, Wyoming.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
20-22, 1981:553-564.

Studies the relationship between cattle and elk near Tensleep, Wyoming. Determines the habitat preferences of elk and cattle, and relates these to forage characteristics (i.e. species composition, forage availability, etc.). Also discusses various factors influencing fluctuation in nutrient levels.
Subject: BE3 RT2 RA2 Area: B Source: AFWL

EL0132

- McIntosh, B.J. and P.R. Krausman. 1981.
Elk and mule deer distributions after a cattle introduction in northern Arizona.
Proc. Wildl.-Livestock Relationships Symp., Coeur d'Alene, Idaho. April
20-22, 1981:545-552.

During the time period from June, 1979 to Nov. 1980, this study was done to test whether or not the introduction of cattle onto a grazing area of mule deer and elk would effect the ungulate distributions. The distributions and movements of the deer and elk were tested one year prior to, and one year after the cattle were introduced. The study area was the Circle-Bar Pasture, in northern Arizona. Methodology was discussed in some detail.
Subject: BE4 RA2 RT2 Area: B Source: AFWL AFWE

EL0138

- Nelson, J.R. and D.G. Burnell.
Elk-cattle competition in central Washington.
Washington State Univ. Pullman, Washington.

Reviews factors influencing elk-cattle competition in central Washington. Some factors are diet similarity, availability, animal distribution patterns, timing and social interaction. Discusses a new analytical method used to correlate the data.
Subject: RA2 BE4 RT2 Area: B Source: LARS

HABITAT ASSESSMENT (RT3)

EL0013

- Beall, R.C. 1974.
Winter habitat selection and use by a Western Montana elk herd.
PhD. Thesis, Univ. of Montana. Missoula, Montana.

Evaluates winter habitat selection and use by a western Montana elk herd from June, 1969 to March, 1973. Looks at usage and selection in terms of activities, ambient meteorological and radiation conditions, and seasonal changes. The methods used were outlined in detail.
Subject: RT3 BE3 Area: B Source: LARS

EL0114

Marcum, C.L. 1975.

Summer - fall habitat selection and use by a western Montana elk herd.
PhD. Thesis, Univ. of Montana. Missoula, Montana.

Outlines an investigation into the summer-fall habitat selection and use by an elk herd in western Montana, from 1971 through 1973. Evaluates the interrelations between elk and various biological and physical habitat factors, based on the data. Discussion of techniques used was quite extensive.

Subject: BE3 RT3

Area: B

Source: LARS

EL0120

Milner, B.J. 1977.

Vegetation analysis of ungulate range exclosures, Elk Island National Park.
Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Documents the vegetation of four woodland and one grassland range exclosure at Elk Island National Park, Alberta. Looks at the effect of ungulate use on the rate of browse growth. The methodology was discussed in detail.

Subject: RA4 RT3

Area: B

Source: WNPL

EL0124

Morris, M.S. and J.E. Schwartz. 1957.

Mule deer and elk food habits on the National Bison Range.
J. Wildl. Manage. 21(2):189-193.

Discusses the forage preferences and the range vegetation of mule deer and elk on the National Bison Range, Montana. Methods used were sample plot range determinations and stomach analysis of the animals.

Subject: RA4 NP2 RT3

Area: B

Source: CWSE

EL0147

Rault, D. 1972.

Ungulate pellet group study, Waterton Lakes National Park, May, 1972.
Warden Serv. Waterton Lakes National Park, Alberta.

Determines habitat types and degree of habitat use by different species of ungulates, using fecal pellet group counts. Discusses the accuracy of this method.

Subject: RT3 RT4 BE3

Area: A

Source: WNPL

EL0162

Skovlin, J.M., P.J. Edgerton and R.W. Harris. 1968.

The influence of cattle management on deer and elk.
23'rd North Amer. Wildl. Conf, March 11-13, 1968:169-181.

Studies the relationship between big game and cattle range usage in the Blue Mountains of Oregon and Washington. Looks into the reasons behind the differing yearly and seasonal use. Methods used are outlined in detail.

Subject: MA2 RA2 RT3 BE3

Area: B

Source: LARS UOAL

EL0165

Snyder, R.O. 1966.

Forage competition between cattle and elk in the Gird Creek Drainage of western Montana.
MSc. Thesis, Univ. of Montana. Missoula, Montana.

Determines the extent of the actual and potential forage competition between cattle and elk in the Gird Creek Drainage in western Montana. Looks at food preferences and nutrition of elk and cattle, and describes forage of the study area. The study techniques used are outlined in detail.
Subject: NP2 RA2 RT3 Area: B Source: CWSE

EL0193

Trottier, G.C. 1976.

Big game range enclosures in the national parks of western Canada.
Can. Wildl. Serv. Edmonton, Alberta.

This report studies the history, location and usefulness of range enclosures in the national parks of western Canada. This evaluation is based on the technique of range evaluation, and how it is useful to the monitoring needs of the parks.
Subject: RT3 Area: A Source: CWSE

EL0198

Walker, D. and Assoc. Ltd. 1980.

Assessment of the Ya Ha Tinda Ranch elk winter range improvement by re-seeding study.
Fish and Wildl. Div., Alta. Energy and Natural Resources. Edmonton, Alberta.

Outlines the condition, climate, vegetation and grazing history of the elk winter range at the Ya Ha Tinda Ranch, Alberta. There is a detailed discussion of the success and efficiency of the study methods used. Management considerations are given as well.
Subject: RA7 RT3 Area: B Source: WNPL

POPULATION DYNAMICS (RT4)

EL0024

Brady, K.S. 1978.

Elk pellet group study, Waterton Lakes National Park.
Warden Serv. Waterton Lakes National Park, Alberta.

Determines the actual or relative number of ungulates (particularly elk) by fecal pellet group counts, documents animal days use in the study areas, discusses techniques for future monitoring of the herd, and looks at the accuracy of the pellet group count method. Some recommendations for species and habitat management are included as well.
Subject: BE3 RT4 Area: A Source: WNPL

EL0023

Brady, K.S. 1975.

A report on wildlife numbers and distribution.
Warden Serv. Waterton Lakes National Park, Alberta.

Documents the results of a wildlife census and distribution survey conducted in Waterton Lakes National Park during the period of Jan., 1974 to Feb., 1975. Results are included in both discussion and table form. Methodology is given some discussion.

Subject: BE2 PD5 RT4

Area: A

Source: AFWL

EL0068

Greer, K.R. and H.W. Yeager. 1967.

Sex and age indications from upper canine teeth of elk (wapiti).
J. Wildl. Manage. 31(3):408-417.

Discusses the reliability of upper canine teeth as indicators of the sex and age classes of elk.

Subject: RT4

Area: B

Source: UOAL

EL0090

Keiss, R.E. 1969.

Comparison of eruption-wear patterns and cementum annuli as age criteria in elk.

J. Wildl. Manage. 33(1):175-186.

Outlines an objective method for estimating the age of elk (*Cervus canadensis*). Explains the use of cementum annuli counts and eruption-wear patterns, and compares the two methods.

Subject: RT4

Area: B

Source: UOAL

EL0091

Kerr, G.R. 1964.

Big game aerial survey.

Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Documents the results of an aerial survey for big game in District #1 in Alberta. Gives information on elk, deer, moose and other animals observed and classified.

Subject: BE2 PD2 RT4

Area: B

Source: AFWL

EL0095

Knight, R.R. 1966.

Bone characteristics associated with aging in elk.

J. Wildl. Manage. 30(2):369-374.

Investigated various bone characteristics as being aging determinants in elk (*Cervus canadensis*).

Subject: RT4

Area: B

Source: UABA

EL0131

- McConnell, B.R. and J.G. Smith. 1970.
Frequency distributions of deer and elk pellet groups.
J. Wildl. Manage. 34(1):29-36.

The paper outlines the possible theoretical frequency distributions of deer and elk pellet groups which can be used to approximate trends in both populations, and range use by these animals. The study was conducted on seven uniform areas in the states of Washington and Oregon.
Subject: RT4 Area: B Source: CWSE

EL0118

- Miller, R.F., W.C. Krueger and M. Vavra. 1981.
Deer (*Odocoileus hemionus hemionus*) and elk (*Cervus canadensis nelsoni*) use on the foothill rangelands in northern Oregon, U.S.A.
J. Range Manage. 34(3):201-204.

Examines range usage by deer and elk in the Wallowa Mountains in northeastern Oregon. Also discusses the reliability of pellet group counts as a method of determining forage use.
Subject: RA4 RT4 RA2 Area: B Source: UABA

EL0134

- Neff, D.J. 1968.
The pellet-group count technique for big game trend, census and distribution : a review.
J. Wildl. Manage. 32(3):597-614.

Discusses a method of pellet-group count in order to determine population dynamics, range usage, and distributions of big game.
Subject: RT4 Area: C Source: CWSE

EL0135

- Neff, D.J., O.C. Wallmo and D.C. Morrison.
A determination of defecation rate for elk.
J. Wildl. Manage.

Discusses accuracy of using pellet group counts to estimate trends in utilization of mountain meadows by elk in Flagstaff Buffalo Park, Arizona.
Subject: RT4 Area: B Source: CWSE

EL0147

- Rault, D. 1972.
Ungulate pellet group study, Waterton Lakes National Park, May, 1972.
Warden Serv. Waterton Lakes National Park, Alberta.

Determines habitat types and degree of habitat use by different species of ungulates, using fecal pellet group counts. Discusses the accuracy of this method.
Subject: RT3 RT4 BE3 Area: A Source: WNPL

EL0177

Stelfox, J.G. and J.R. McGillis. 1977.
 Ungulate surveys manual for prairie and western Canadian national parks.
 Can. Wildl. Serv. Edmonton, Alberta.

Discusses various research techniques for determining populations, compositions, and distributions of ungulates in prairie and western Canadian national parks.
 Subject: RT4 Area: A Source: KPWL

EL0229

Stelfox, J.G., B. Kloosterman and M.C. Kingsley. 1977.
 Wildlife census and survey project in national parks of western Canada. Phase 1 : computerized program for recording and analyzing wildlife data in the national parks of western Canada.
 Can. Wildl. Serv. Edmonton, Alberta.

Discusses the use of a computer-acceptable program for recording and analyzing wildlife data in western and prairie national parks. Data variables include habitat type, topography, wildlife species numbers, age-sex composition and behavior.
 Subject: RT4 Area: B Source: CWSE

EL0204

Watt, R. 1983.
 Wildlife survey - March 26, 1983, Waterton Lakes National Park.
 Waterton Lakes National Park Warden Serv. Waterton Lakes National Park, Alberta.

Documents the results of aerial and ground surveys of wildlife in Waterton Lakes National Park, March 26, 1983. Details of methods used and costs incurred are included.
 Subject: RT4 BE2 Area: A Source: AFWL

EL0205

Watt, R. 1983.
 Wildlife survey, Waterton Lakes National Park.
 Waterton Lakes National Park Warden Serv. Waterton Lakes National Park, Alberta.

Documents results of aerial and ground surveys of wildlife in Waterton Lakes National Park, Feb. 3, 1983. Details of methods used and costs incurred are included.
 Subject: RT4 BE2 Area: A Source: AFWL

PHYSIOLOGY (RT5)

EL0059

- Gates, C.C. 1980.
 Patterns of behavior and performance of wapiti (*Cervus elaphus nelsoni*) in the boreal mixed wood forest.
 PhD. Thesis, Univ. of Alta. Edmonton, Alberta.

Study investigates the behavior and productivity of wapiti in relation to seasonal changes in physical and biotic elements of a boreal mixed wood environment in central Alberta. Aspects of behavior studied include foraging and habitat selection, activity budgets, Circadian activity patterns, and weight dynamics.

Subject: BE3 NP4 RT5 BE5 Area: B Source: UAAS

EL0066

- Greer, K.R. and Jr. W.W. Hawkins 1967.
 Determining pregnancy in elk by rectal palpation.
 J. Wildl. Manage. 31(1):145-149.

Discusses rectal palpation as a means of determining pregnancy in elk. The animals used were taken from Montana.

Subject: RT5 Area: C Source: CWSE

EL0153

- Robbins, C.T., Y. Cohen and B.B. Davitt. 1979.
 Energy expenditure by elk calves.
 J. Wildl. Manage. 43(2):445-453.

Discusses bioenergetics of elk calves (*Cervus canadensis*). Relates the energy used to factors such as horizontal and vertical locomotion. Outlines the most effective indicators of energy expenditure.

Subject: NP4 RT5 Area: B Source: UABA

EL0184

- Struhsaker, T.T. and A. Parsekian. 1965.
 The relation of age, sex and time of day to activity in free-ranging elk (*Cervus canadensis*).
 Can. Wildl. Serv. unpub. report. Edmonton, Alberta.

Studies the relationship of activity of elk to age, sex and time of day. The study area is Banff National Park, Alberta. Some details on the methods used are also given.

Subject: NP4 RT5 Area: B Source: CWSE

NECROPSY AND FORENSIC SCIENCE (RT6)

EL0130

McBee, R.H., J.L. Johnson and M.P. Bryant. 1969.

Ruminal microorganisms from elk.
J. Wildl. Manage. 33(1):181-186.

Gives details of the numbers and kinds of bacteria and protozoa present in the rumen contents of four Yellowstone elk (*Cervus canadensis*). Outlines the use of studies of this type for assessing animal and environmental conditions.
Subject: RT6 PD3 Area: B Source: UABA

EL0144

Pederson, R.J. and A.A. Pederson. 1975.

Blood chemistry and hematology of elk.
J. Wildl. Manage. 39(3):617-620.

Documents 11 hematologic and 13 blood chemical characteristics of blood samples obtained from Rocky Mountain elk (*Cervus canadensis nelsoni*). Compares these values between various age and sex groups. The area of study was Bobsled Ridge, Umatilla County, Oregon.
Subject: RT6 NP3 Area: B Source: UOAL

TELEMETRY, CAPTURE AND HANDLING (RT7)

EL0236

Bear, G.D. 1979.

Elk population and ecology studies.
Colorado Div. Wildl. Colorado.

This report details the testing of trapping and handling techniques and radio telemetry. Use of a seven-element beam antenna was found to give more accurate locations than those provided by a three-element antenna. The study area was the southern Platte River Basin, Boulder County, Colorado.
Subject: RT7 Area: B Source: DIAL

EL0031

Coggins, V.L. 1975.

Immobilization of Rocky Mountain elk with M99.
J. Wildl. Manage. 39(4):814-816.

Discusses the use of M99 as an immobilizing agent on Rocky Mountain Elk (*Cervus canadensis*) in Oregon.
Subject: RT7 Area: B Source: UOAL

EL0042

Craighead, J.J., M.G. Hornocker M.W. Shoesmith and R.J. Ellis. 1969.

A marking technique for elk.
J. Wildl. Manage. 33(4):906-909.

Describes a collar method for marking, which was tested on elk in Yellowstone

National Park over a five year period. Includes information on availability and cost of materials used, observability of the devices, and the conditions of the collars after the study.

Subject: RT7

Area: B

Source: UOAL

EL0048

Eslinger, D. 1984.

A7 elk trapping project.

Alta. Dept. Lands and Forests, Fish and Wildl. Div. Lethbridge, Alberta.

Details the operation of the elk trapping program at the A7 ranch. Included is an outline of man hours expended and associated costs for materials and services. Gives recommendations for future trapping operations as well.

Subject: RT7

Area: B

Source: AFWL

EL0062

Gibbons, T. and K. Baker. 1976.

Elk study, Kootenay National Park - interim report.

Indian and Northern Affairs, Parks Canada.

Documents seasonal elk distribution in and around Kootenay National Park during 1975 and 1976. Techniques used include immobilization, and monitoring using radio collars and colored neck bands.

Subject: BE2 RT7

Area: B

Source: KPNL

EL0061

Gibbons, T.R. 1978.

Kootenay National Park, elk study, 1976-1978.

Parks Canada.

Documents techniques used when determining migration patterns of elk in Kootenay National Park. Immobilization and radio collars were the main methods used.

Subject: RT7 BE2

Area: B

Source: KPNL

EL0103

Lewis, R.J., G.A. Chalmers M.W. Barrett and R. Bhatnager. 1977.

Capture myopathy in elk in Alberta, Canada : a report of three cases.

J. Amer. Vet. Med. Assoc. 171(9):927-932.

Reports of three elk (*Cervus canadensis*) with acute capture myopathy are given. Outlines the details of necropsies, and methodologies used in the diagnoses. Some discussion is given as to the cause of this disease. Many illustrations are included.

Subject: RT7

Area: B

Source: AFWL

EL0158

Shoesmith, M.W. 1968.

The impact of winter range elk trapping and transplanting on summer population segments of the northern Yellowstone elk herd.

Montana Coop. Wildl. Research Unit. Univ. of Montana.

Discusses results and recommendations of a trapping program during 1962-1968 for elk of the northern Yellowstone herd, Montana.

Subject: RT7

Area: B

Source: CWSE

EL0202

Wasem, C.R. 1967.

Immobilization of Rocky Mountain elk in Waterton Lakes National Park.
Wildl. Manage. Glacier National Park, Montana.

Discusses the dosages, effects, and results of using Succinylcholine chloride for immobilizing Rocky Mountain elk (*Cervus canadensis nelsoni*) in Waterton Lakes National Park.

Subject: RT7

Area: A

Source: CWSE

EL0203

Wasem, R.C. 1968.

Aquatic ecology studies and banded elk movement studies.
Office of Natural Science Studies, National Park Serv. Washington, D.C.

Documents the movements and locations of banded elk tagged in Waterton Lakes and Glacier National Parks from 1966 to 1968. Detailed discussion of handling and marking technique is given.

Subject: BE2 RT7

Area: A

Source: AFWL WNPL

EL0210

Woody, N.G., G. McClain and P. Stapleton. 1973.

Elk live capture transplant program, Jasper National Park, 1972 - 1973.
Jasper National Park Warden Serv. Jasper National Park, Alberta.

Report describes in detail the equipment needed, procedures, costs, results and problems of capturing elk live within Jasper National Park, in order to transport them to another area.

Subject: RT7

Area: B

Source: KPWL

EL0212

Woolf, A. and J.H. Swart. 1970.

Etophine Hydrochloride : anesthetic for surgery on elk (*Cervus canadensis canadensis*).

J. Amer. Vet. Med. Assoc. 157(5):641-642.

Outlines the use and results of etophorine hydrochloride as an anesthetic for surgery on elk (*Cervus canadensis canadensis*).

Subject: RT7

Area: C

Source: CWSE

DISEASES AND PARASITES (RT8)

EL0077

Hepworth, W.G. and G.M. Thomas. 1962.

Attempts to transfer psoroptic mites from elk to cattle and sheep.
J. Amer. Vet. Med. Assoc. 140(7):689-690.

Discusses an attempt to artificially transfer the elk scabies mite to domestic cattle and sheep.

Subject: RT8

Area: B Source: UABA

EL0085

Jacobson, R.H., D.E. Worley and K.R. Greer. 1969.

The fringed tapeworm (*Thysanosoma actinioides*) as a parasite of the Rocky Mountain elk in Yellowstone National Park.

Bull. Wildl. Dis. Assoc. 5:95-98.

Documents incidence of *Thysanosoma actinioides* in the Rocky Mountain elk of Yellowstone National Park. Gives details of infections, such as length of the tapeworm, and distribution in the small intestine.

Subject: PD3 RT8

Area: B Source: ADRI

EL0182

Stott, J.L., L.H. Lauerma and A.J. Ruedke. 1982.

Bluetongue virus in elk (*Cervus canadensis*) and their calves.

Amer. Med. J. Vet. Res. 43(3):423-428.

Discusses the effects of inoculation of pregnant elk with Bluetongue virus serotype II. Includes full description of methods used for experimentation.

Subject: RT8 PD3

Area: B Source: UABA

EL0191

Thorne, E.T., J.K. Morton and W.C. Ray. 1979.

Brucellosis, its effect and impact on elk in western Wyoming. In North American elk, behavior and management. pp. 212-220.

Univ. of Wyoming. Laramie, Wyoming.

Documents the results of a ten year study investigating the incidence and effect of Brucellosis on elk on the National Elk Refuge and Greys River Feedground, Wyoming. Included is an evaluation of four serologic tests for detection of Brucellosis in wild elk.

Subject: PD3 RT8

Area: B Source: LARS

IMPACT ASSESSMENT (RT10)

EL0231

Douglas, G.W., J.A.S. Nagy and G.W. Scotter. 1975.

Effects of human and horse trampling on natural vegetation, Waterton Lakes National Park.

Can. Wildl. Serv. Calgary, Alberta.

In 1973, a three-year project to assess various intensities of human and horse traffic impact at different intervals during the growing season and on various undisturbed vegetation communities in Waterton Lakes National Park was undertaken. This report details the results of the 1973 field work.

Subject: MA4 RT10

Area: A Source: WNPL

EL0100

Kuhn, J.A. and B. Martens. 1979.
 Coal mine development and elk biology : environmental impact assessment in Alberta and British Columbia. In North American elk : ecology, behavior and management., Boyce and Hayden-Wing, Eds.
 Univ. of Wyoming. Wyoming.

Looks at the impact of coal mining on elk in the Rocky Mountains of Alberta and British Columbia. Extensive description of methodology is given, as well as an outline of approaches to impact assessment.
 Subject: BE6 MA4 RT10 Area: A Source: CWSE

EL0200

Ward, A.L. 1976.
 Elk behavior in relation to timber harvest operations and traffic on the Medicine Bow Range in south-central Wyoming.
 Elk-Logging-Roads Symp. Proc., Moscow, Idaho. Dec. 1976:32-43.

Puts together data on elk behavior in relation to timber harvest and traffic on the Medicine Bow Range, Wyoming. Methods used were radiotelemetry, time-lapse photography and counts of elk tracks on roads.
 Subject: RT10 MA4 BE6 Area: B Source: AFWL

FOOD HABITS (RT11)

EL0056

Follis, T.B. and J.J. Spillet. 1972.
 A new method for rumen sampling.
 J. Wildl. Manage. 36(4):1336-1343.

Describes a method for collecting rumen samples from live animals without any injuries. Rumen analysis is then done, in order to characterize the diets of wild ruminants.
 Subject: RT11 Area: B Source: UOAL

EL0075

Hansen, R.M. and 1975.
 Diet overlap of deer, elk and cattle in southern Colorado.
 J. Range Manage. 28(1):43-47.

Seasonal dietary overlaps for mule deer, elk and cattle were estimated through analysis of fecal samples taken from Dec. 1970 to Nov. 1971. The study area was a private ranch in Colorado.
 Subject: BE3 NP2 RT11 Area: B Source: AFWL

EL0079

- Hobbs, N.T., D.L. Baker J.E. Ellis and D.M. Swift. 1979.
Composition and quality of elk diets during winter and summer : a preliminary analysis. In North American elk : ecology, behavior and management, Boyce and Hayden-Wing, Eds. pp. 47-53.
Univ. of Wyoming. Wyoming.

Details a study carried out in Rocky Mountain National Park, Colorado, to determine the composition and quality of elk diets on both summer and winter ranges. Methods used were outlined in detail.

Subject: NP2 RT11 Area: B Source: CWSE

EL0248

- McReynolds, S.J. 1977.
Seasonal elk food habits and diet quality in central Washington.
M.Sc. Thesis, Wash. State Univ., Dept. Forestry and Range Manage.

Analysed seasonal diets of elk from microhistological examination of plant fragments in fecal material. Performed proximate analysis of forage samples in all seasons (moisture, crude protein, crude fat, ADF, ash, Ca and P). Seasonal diet composition and plant chemical composition were combined to determine seasonal nutrient intake.

Subject: NP2 RT11 Area: B Source: UOAL

HEALTH AND CONDITION (RT12)

EL0065

- Greer, K.R. 1968.
A compression method indicates fat content of elk (wapiti) femur marrows (condition criterion).
J. Wildl. Manage. 32(4):747-751.

Describes a compression method which evaluates the fat content of elk femur marrows. Looks at the cost and accuracy of this method.

Subject: RT12 PD3 Area: B Source: UABA

EL0185

- Taber, R.D. 1958.
Development of the cervid antler as an index of late winter physical condition.
Proc. Acad. Sciences 18:27-28.

Discusses growth and development of cervid antlers as an indication of physical condition in the late winter.

Subject: PD3 RT12 Area: B Source: CWSE

APPENDIX I: EXPLANATION OF SOURCE CODES

Source codes listed for each bibliographic entry indicate the physical location at which that entry was found.

ADRI = Animal Disease Research Institute, Lethbridge
AFWE = Alberta Fish and Wildlife Library, Edmonton
AFWL = Alberta Fish and Wildlife Library, Lethbridge
ARPL = Alberta Recreation and Parks Library, Edmonton
BFWC = B.C. Fish and Wildlife Branch, Cranbrook
BFWN = B.C. Fish and Wildlife Branch, Nanaimo
BFWV = B.C. Fish and Wildlife Branch, Victoria
CWSE = Canadian Wildlife Service Library, Edmonton
DIAL = Dialog Information Services Inc.
KPNL = Kootenay National Park Naturalist Library
KPWL = Kootenay National Park Warden Library
LARS = Agriculture Canada Research Station, Lethbridge
UAAS = Univ. of Alberta Animal Science Dept., Edmonton
UADZ = Univ. of Alberta Zoology Dept., Edmonton
UABA = Biological Abstracts, Univ. of Alberta Cameron Library
UOAL = Univ. of Alberta Library
UOCL = Univ. of Calgary Library
WNPL = Waterton Lakes National Park Library

APPENDIX II: ACCESSING SPIRES SUBFILES

This appendix contains reproductions of SPIRES tutorials from the University of Alberta Computing Services dealing with searching and updating SPIRES subfiles. These subfiles are accessible to anyone having an account with the University of Alberta Computing Services and a user ID. Procedures for accessing MTS at the University of Alberta via DATAPAC are also included.

SHEEP.BIB and ELK.BIB are public subfiles in SPIRES containing bibliographic entries specific to Rocky Mountain bighorn sheep and elk-livestock-range relationships. They are maintained on magnetic disc at the University of Alberta Computing Services and administered by Parks Canada, Western Region and the Department of Forestry, Faculty of Agriculture-Forestry, University of Alberta.

Public access to these subfiles is restricted to search and display functions only. However, updating of these bibliographies by user agencies or individuals is encouraged. For information about the subfiles and obtaining updating privileges contact:

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tutorial

Computing Services
The University of Alberta

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T131.0483

Introduction to SPIRES Searching Class Notes

1 Purpose SPIRES (Stanford Public Information RETrieval System) is a generalized information storage and retrieval system, originally developed at Stanford University. An interactive system, SPIRES allows the user to create, maintain, and search information stored on the computer.

2 Use run *spires

3 Description The functions and capabilities of SPIRES may be summarized as follows:

On-Line Help Facilities

SPIRES provides on-line tutoring for the uninitiated user. The HELP command introduces other tutorial commands such as EXPLAIN. The user can obtain detailed explanations of subfiles, commands, and errors.

On-Line Searching

SPIRES provides a clear, simple set of commands for searching at a terminal. You select the subfile you want to search and identify the elements desired. The system then finds the records containing the given value. You can broaden or narrow the search progressively.

Flexible Display of Results

Once you are satisfied with the number of results in a search, you may display all or portions of the results at the terminal. SPIRES will also format the results if you wish. When you establish a data base, you can decide how the information is to be arranged on output. Similarly, when a search result is found, you can choose a format in which the result is to be displayed. This allows the result to be presented in a variety of ways.

Applications of SPIRES

SPIRES is used in a wide variety of applications, many of which are publicly available. These include:

BOREAL: the catalogue of new acquisitions of the Boreal Institute for Northern Studies Library, Edmonton. The subfile is currently used to produce library catalogue cards, and can be searched by keyword, title, personal-author, corporate-author, and UDC (Universal Decimal

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Classification) number.

COIN: a survey of computerized data bases that are publicly available in Canada. The subfile, maintained by Information Services, Alberta Research Council, contains information on the location, subject area, cost, contacts, and other details on each data base.

DATA LIBRARY: the catalogue of The University of Alberta Data Library holdings. The subfile contains detailed information on each data set recorded and can be searched by title, author, keywords, local contact, and other elements.

DOCUMENTS: a data base that describes all the written information available from Computing Services. It can be searched by keyword, area, or title.

PROGRAMLIST: a listing that describes the programs and subroutines publicly available through the Computing Services Department, University of Alberta. It can be searched by program name, title, keywords, type, and contact.

In addition, a wide variety of private subfiles have been developed, including a patient-records subfile and a student-records subfile.

4 SPIRES Terminology

SUBFILE	-	a data base consisting of data records and indexes
DATA RECORD	-	all data elements relating to an item in the subfile, for example, an individual student record. Also known as 'goal record'.
KEY	-	an element that uniquely identifies a particular data record; for example, a Social Insurance number, a Student ID number.
DATA ELEMENT	-	a single named unit of information. For example, a student's name.
ACTIVE FILE	-	an MTS line file used by SPIRES for either input or output. By default, SPIRES uses a temporary file called -SAF.
INDEX	-	a type of record used to identify records that meet given criteria
SEARCH RESULT	-	data records found by SPIRES when searching an index
SEARCH TERM	-	a value used to identify desired records
SEARCH LOGIC	-	combining search terms using the logical operators

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AND, OR, and NOT. AND is used when both terms must appear in the search result, OR when one or the other or both must appear, and NOT when a term is to be excluded from the search result.

- FORMAT - a means of displaying information from data records in a particular layout
- GLOBAL FOR - a mode of SPIRES operation allowing the sequential location and manipulation of data records; also allows searching for unindexed information.

5 SPIRES Commands

The commands you issue are shown below in uppercase; words typed in lowercase should be replaced as necessary. Square brackets ([]) group options, which may be specified as necessary. The 'or' symbol (|) separates alternatives, only one of which may be used.

Most SPIRES commands may be abbreviated to the first three characters.

- (1) HELP - explains where you are and makes suggestions about what to do next
- (2) EXPLAIN term - gives information on *term*. *Term* may be a SPIRES command, an error message code, or a SPIRES term.
- (3) SHOW EXPLAIN - gives a complete list of terms that can be explained with the EXPLAIN command
- (4) SHOW [PRIVATE|PUBLIC] SUBFILES - the SHOW SUBFILES command gives a list of all the subfiles available to your signon ID. SHOW PRIVATE SUBFILES lists all private subfiles you have access to; SHOW PUBLIC SUBFILES lists all public subfiles.
- (5) EXPLAIN SUBFILE|SF subfile name - prints the explanation provided by the file owner that is contained in a subfile's definition; not all subfiles have such an explanation
- (6) SELECT subfile name - chooses a subfile for you to work with
- (7) SHOW SUBFILE SIZE - displays the number of data records in the subfile
- (8) SHOW ELEMENTS [DICTIONARY|NAMES] - SHOW ELEMENTS gives a list of the data element names defined for the subfile. SHOW ELEMENTS NAMES lists the data element names and aliases used; SHOW ELEMENTS DICTIONARY lists the data element names and aliases and indicates which are fixed, required, and optional.
- (9) SHOW INDEXES - gives a list of the indexes available for searching

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- (10) BROWSE [FIRST|LAST] index
or
BROWSE index [value] - the BROWSE *index* command lists a random sample of the values found in the index requested. BROWSE FIRST *index* lists the first ten values in the index and asks if you want more. Similarly, BROWSE LAST *index* lists the last ten terms in the index and asks if you want more. BROWSE *index value* lists five terms before the value and five after and asks if you want more.
- (11) FIND index [relational operator] search term - searches the index named for the search term(s) specified. Relational operators may be: = (equal to), > (greater than), < (less than), >= (greater than or equal to), <= (less than or equal to), or != (not equal to). Search expressions may be combined using the logical operators AND, OR, and NOT; parentheses may be used to specify an order other than left to right.
- (12) BACKUP - steps back to the previous search result, if any
- (13) SHOW SEARCH - lists the search logic that has been used to generate the current search result
- (14) SHOW RESULT - shows the number of records in the current search result
- (15) TYPE [element list] [PAUSE|KEEP] - the TYPE command prints the data records in the current search result at the terminal, in the current format. TYPE *element-list* types those elements named in the element-list; TYPE PAUSE pauses after each record is shown, and waits for a carriage return before continuing with the next. TYPE KEEP allows you to edit the search result, keeping only those records you select.
- (16) DISPLAY key - prints the record identified by *key* at the terminal
- (17) OUTPUT [element-list] [CLEAR|CONTINUE] [CLEAN] - the OUTPUT command copies the search result into the current active file. OUTPUT *element-list* copies those elements named in the element-list. OUTPUT CLEAR clears the active file before copying the search result. OUTPUT CONTINUE appends the search result to the contents of the active file. OUTPUT CLEAN suppresses the record separators (**** and ;) that normally appear between records if the report option is not used with the currently set format.
- (18) SET ELEMENTS [+|-] element-list - SET ELEMENTS *element-list* specifies which elements are to be used with the TYPE, DISPLAY, and OUTPUT commands. SET ELEMENTS + *element-list* adds new elements to a previously set list; SET ELEMENTS - *element-list* removes the elements listed from the set list. NOTE: SET ELEMENTS command will override the currently set format.

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- (19) **CLEAR ELEMENTS** - **CLEAR ELEMENTS** cancels any previously set elements; the **TYPE**, **DISPLAY**, and **OUTPUT** commands will revert to using the currently set format, or the complete element list.
- (20) **LIST [OFFLINE] [UNNUMBERED]** - **LIST** will print the contents of the current active file at the terminal, with line numbers (similar to the MTS command **LIST filename**). **LIST OFFLINE** lists the active file on the printer; **LIST UNNUMBERED** copies the contents of the active file to the terminal, without line numbers (similar to the MTS command **COPY filename**).
- (21) **SEQUENCE [element-list]** - **SEQUENCE** sorts records in the result according to their key; **SEQUENCE element-list** sorts them according to the specified elements
- (22) **SHOW FORMATS** - lists the formats that are available for use
- (23) **SET FORMAT format-name** - chooses a format for use with the **DISPLAY**, **OUTPUT**, and **TYPE** commands
- (24) **CLEAR FORMATS** - causes the SPIRES default format to be used; this format precedes each element with its name and ends it with a ; (semicolon)
- (25) **SET REPORT** - causes the printer control options to be used with the currently set format
- (26) **STOP** - finishes the SPIRES session and returns you to MTS

6 Using SPIRES After signing on to MTS, issue the command:

```
run *spires
```

SPIRES prints the message of the day (if any), and indicates that it is ready to accept commands with the SPIRES prompt, **->**.

7 Sample SPIRES Session

A sample SPIRES session is listed below. User input is printed in bold type; SPIRES responses are in normal type. It will cost you approximately \$6 to work through this SPIRES session, if you choose to do so.

```
#run *spires
#12:21:25
-SPIRES 83.04
->show subfiles
-No private subfiles
  Public Subfiles.
ACTIONS
AGENCY
```

Introduction to SPIRES Searching Class Notes

AGI
ALI
ALPFILE
AOSI
ASTIS
ASTIS AUTHOR INDEX
ASTIS GEOGRAPHIC INDEX
ASTIS SUBJECT INDEX
BACK PROCDEF
BACK RECDEF
BACKFILE
BIBLIOGRAPHY
BOREAL
BOREAL CODES
BULL-INDEX
CALDOC
CANIMM
CATALOG

.

.

.

NETWORKS
PEOPLE
PERSONNEL
PPR
PROCDEF
PROG KEYWORDS
PROGRAMLIST
PROTO.LIB
PUBLIC PROTOCOLS
QZZ4.PROTOCOLS
RECDEF
RECHAR
RECLAIM
RESTAURANTS
RIE

.

.

.

->explain subfile restaurants

This subfile contains data about restaurants.
Additions and modifications are encouraged as part of the
process of becoming familiar with the use of SPIRES.

The following indices may be used in your search. BROWSE
them in order to see what values they may have.

ADDRESS (OR LOC OR LOCATION OR ADDR)
COST (Inexpensive for less than \$20 per couple,
moderate for \$20 to \$40 per couple,
and expensive for more than \$40 per couple.)
FOOD (the type of food served, e.g., German, pizza, machine)
MEALS (B=breakfast, L=lunch, S=supper)

Introduction to SPIRES Searching Class Notes

Additionally, there is a nonsearchable comments field.
Bon Appetit.

```
->select restaurants
->show file size
  -The Subfile has      164 Records.
->show elements
  Record Elements
    ID
    NAME
    PHONE
    COST
    LOCATION
    FOOD
    COMMENTS
    MEALS
    PARKING
    RESERVATIONS
    WINE-LIST
->show index
  Goal Records:  RESTAURANT
  Simple Index:  N, NA, NAME
  Simple Index:  ADDR, ADDRESS, LOC, LOCATION
  Simple Index:  C, COST
  Simple Index:  CU, CUISINE, F, FOOD
  Simple Index:  H, HOURS, M, MEAL, MEALS, OPEN
->browse food
  EXQUISITE
  FRENCH
  SANDWICHES
  SIMPLE
  SPAGHETTI
  STEAKS
  UKRANIAN

->find food european
  -RESULT: 2 RESTAURANT(S)
->type
```

MOSHE'S POSH DELI

Type of food:	DELICATESSEN, EAST EUROPEAN, SANDWICHES, SOUPS	Price range:	MODERATE
Address:	409 3ST. S.W.		
Phone:	232-6427		
Parking:	PUBLIC PARKING IN THE AREA	Open:	LUNCH, DINNER (M-S) LUNCH ONLY (SUNDAY)
Reservations:	RECOMMENDED		

Introduction to SPIRES Searching Class Notes

Comments: BANQUET FACILITIES UP TO 40, DINNER AND DANCE BAND
NIGHTLY, CREDIT CARDS: CX MC AMX DC

...

Bistro Praha Gourmet Snack Bar

Type of food: European

Price range: moderate to
expensive

Address: 10168 100A Street

Phone: 424-1046

Parking: Unfortunately, only a few
meters nearby

Open: excellent quality
European-style dining

Wine list: extensive

Reservations: accepted

Comments: This little obscure coffee house is THE place to go
with friends who enjoy gourmet coffees, snacks,
full-course meals, good wine, and good music (classical
over the speakers constantly!) The atmosphere is
perfect and the cuisine impeccable, with a full range
of prices. Highly recommended for the Artsy crowd.

->find food chinese or japanese

-RESULT: 21 RESTAURANT(S)

->and cost inexpensive

-RESULT: 13 RESTAURANT(S)

->sequence name

-STACK: 13 RESTAURANT(S)

->type pause

Bamboo Palace

Type of food: Chinese

Price range: inexpensive

Address: Cor. 81 Ave & 104 Street

Phone: 439-4444

Open: Lunch, Dinner

Wine list: Beer, Wine, Cocktails

Reservations: Unnecessary

Comments: Selections include the Peking duck, oriental style
lobster, Cantonese broiled crabs, barbequed whole fish

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and Western steaks. Daily Chinese smorgasbord.

... (Press Enter/Return key to continue)

Canton Kitchen

Type of food: Chinese, Western Price range: Inexpensive
Address: 10016 103 Avenue
Phone: 422-2878 Open: Breakfast, Lunch and Supper
Wine list: licensed
Comments: reasonable restaurant licensed never too busy, open
 til 11pm closed sundays

...

.
.
.

...

The Cathayan

Type of food: Chinese Price range: Inexpensive
Address: 10516 82 Avenue
Phone: 433-1308 Open: Lunch and supper
Wine list: Fully licensed
Reservations: Accepted
Comments: Cantonese food and some Western dishes served in
 newly-renovated (1975) quarters. The food is very good
 and service is fast. Open Monday to Thursday from
 11:30am to 12:30am, to 2:30am Friday and Saturday, and
 from noon to 10pm Sunday.

...

->set element name
->type

NAME = Bamboo Palace;

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NAME = Canton Kitchen;

NAME = Empress of China;

.
.
.

->select cije

->explain subfile cije

(CIJE) Current Index to Journals in Education

Information on education literature in over 775 journals
of interest to every segment of the educational profession.

Read the free write-up:

Use of ERIC T112.0381

Available from:

(1) Division of Educational Research Services
Room 3-102C
Education North Building
The University of Alberta

(2) Computing Services
Room 372
General Services Building
The University of Alberta

On-line searchable data base, updated every 3 months,
from a magnetic tape received from
(ERIC) Educational Resources Information Center

The information is available to anyone having a Computing
Account with Computing Services

Report any problems to:
SPIRES Consultants (403) 432-3884

->show file size

-The Subfile has 103626 Records.

->show index

Goal Records: HIT

Simple Index: D, DES, DESC, DESCRIPTOR, K, KEY, KEYWORD, W, WORD

Sub-Index: NULL

Simple Index: A, AUT, AUTHOR

Sub-Index: NULL

Simple Index: T, TI, TIT, TITL, TITLE

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Simple Index: J, JOU, JOUR, JOURN, JOURNAL
Simple Index: DATE, PD, PUB, PUB.DATE
Simple Index: L, LOC, LOCATION
Simple Index: INST, INSTITUTION
Simple Index: I, IDEN, IDENT, IDENTIFIER

->browse title computer

COMPUTATIONNELLE

COMPUTATIONS

COMPUTE

COMPUTED

COMPUTEP

COMPUTER

COMPUTERISED

COMPUTERIZATION

COMPUTERIZE

COMPUTERIZED

-MORE?no

->find title prefix comput

-RESULT: 1461 HIT(S)

->or title automation

-RESULT: 1493 HIT(S)

->and (t education or teaching or learning)

-RESULT: 260 HIT(S)

->show search

fin t pre comput

or t automation

and (t education or teaching or learning)

->type title

TITLE = Teaching and Assessing Computational Estimation Skills.;

TITLE = Low Cost Computer Graphics in Engineering Education.;

TITLE = Computer Technology and Education.;

TITLE = Improvement of Science and Mathematics Education with the
Use of Computer-Assisted Instruction (CAI) System.;

<attn> (Press the ATTN/PA1 key to stop.)

->and date >= 1980

-RESULT: 148 HIT(S)

->sequence journal.cit

-STACK: 148 HIT(S)

(Be warned that if you issue the following command, you will
receive and be charged for a 50-page document. To look at the
contents of the active file on your terminal issue the LIST
UNNUMBERED command instead.)

->list off unnumbered

#\$COPY -SAF *PRINT*

PRINT ASSIGNED RECEIPT NUMBER 851461

->select data library

->show formats

Introduction to SPIRES Searching Class Notes

Subfile Format Names:

FULLDOC
SHORTDOC (Set)

->show index
Goal Records: DATABASE
Simple Index: K, KEYWORD, KEYWORDS, T, TITLE
Simple Index: A, AUTHOR, I, INVESTIGATOR
Simple Index: TY, TYPE
Simple Index: D, DATE
Simple Index: P, PUBLISHER
Simple Index: SER, SERIES
Simple Index: ACCESS, HOLD.STATUS, ST, STATUS
Simple Index: ***

->show file size
-The Subfile has 278 Records.

->show element dictionary

** Fixed **
STUDY.NUMBER, STU (key)
DATE-ADDED, DA
DATE-UPDATED, DU
** Required **
TITLE, T, TIT
** Optional **
TYPE, TY
SEARCH, S
VARIABLES, V
UPDATES, U
ABSTRACT, AB
KEYWORDS, KEYWORD, K
INVESTIGATOR, A, I, AUTHOR
EXTENT, EXT
ACCOMP.MATERIAL, ACC
COVERAGE, COV
CONTACT, CON
EDITION, ED
AVAILABILITY, AV
FORMAT, F
DATE, D
PUBLISHER, P
PLACE, PL
COMMENTS, C
NOTE, N
NO.VAR, NV
NO.CARD, NC
CASES, CA
SERIES, SER
HOLD.STATUS, ACCESS, STATUS, ST
PUBLICATIONS, PUB

->browse type
BIBLIOGRAPHIC
OTHER
STATISTICAL

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->browse keyword information

INDUSTRIES
INFANT
INFANTS
INFLATION
INFLUENCE
INFORMATION
INSTITUTE
INSTRUCTIONAL
INTEGRATION
INTENSITY

-MORE?no

->find keyword information

-RESULT: 1 DATABASE(S)

->type

U OF A STUDY NUMBER: 233

DATA SET NAME: ERIC - Educational Research Information Centre

TYPE: Bibliographic

STATUS: Registered

PRINCIPAL INVESTIGATOR(S): Educational Resources Information
Center

EXTENT OF FILE: 2 data files (71439, 52045 logical records) as of
June 1981

ABSTRACT: An educational data base maintained by the U.S.
National Institute of Education which covers all citations,
including abstracts, published monthly in Research in Education
(RIE) and Current Index to Journals in Education (CIJE). Both RIE
and CIJE data bases are now available for searching on SPIRES. At
the present time, there 37,000 entries in RIE and 48,000 entries
in CIJE.

RESTRICTIONS: Available to U. of A. users

CONTACT: Data Library
Computing Services
502 Students' Union Bldg.
Phone 432-3872

->show format

Subfile Format Names:

FULLDOC
SHORTDOC (Set)

->set format fulldoc

->type

1 U OF A STUDY NUMBER: 233

DATA SET NAME: ERIC - Educational Research Information Center

Introduction to SPIRES Searching Class Notes

TYPE: Bibliographic
STATUS: Registered

PRINCIPAL INVESTIGATOR(S): Educational Resources Information
Center

PUBLISHER: Educational Resources Information Center

PUB. PLACE AND DATE: Washington, D.C., 196->

UPDATES: Quarterly

EXTENT OF FILE: 2 data files (71439, 52045 logical records) as of
June 1981

NOTES:

There are two ERIC files - RIE (52045 logical records) and CIJE
(71439 logical records)

ABSTRACT: An educational data base maintained by the U.S. National
Institute of Education which covers all citations, including
abstracts, published monthly in Research in Education (RIE) and
Current Index to Journals in Education (CIJE). Both RIE and CIJE
data bases are now available for searching on SPIRES. At the
present time, there 37,000 entries in RIE and 48,000 entries
in CIJE.

VARIABLES: Abstract, Author, Date, Document type, Descriptors,
Source, Title

KEYWORDS: Early childhood education
Education - Bibliography
Education administration
Education in Canada
Study and teaching

RESTRICTIONS: Available to U. of A. users

PUBLICATIONS:

CONTACT: Data Library
Computing Services
Students' Union Bldg.
Phone 432-3884

->select people
->display aheq

Sherlock Holmes, NONE GIVEN

Affiliation: Scotland Yard

Mailing address: 221 B Baker Street, London, England

Telephone - Business: None Home: None

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Home address: 221 B Baker Street, London, England

Background: London Hospital, Lab technician

Interests: Chess, violin, soil types, cocaine, cigar ashes,
crime, Professor Moriarity

Date - Entered: Thur. June 18, 1981
Last modified: Thur. June 18, 1981

->stop

8 Comments Introductory and advanced SPIRES workshops are offered by Computing Services. To register, contact the Training Assistant at 432-2511. For more information, contact the SPIRES Consultants at 432-3884.

9 More Information

As you can see from this introduction, SPIRES is an extremely versatile system for data retrieval. To learn more about SPIRES searching, purchase the manuals *SPIRES Searching Primer* T17 and *SPIRES Searching and Updating* T14 at the University Bookstore. Adding records to a SPIRES subfile is discussed in the SPIRES Updating Course; other topics are covered in the advanced sessions.

If you would like more information about SPIRES, call the SPIRES Consultants at 432-3884.

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Terminal Session Exercise

If you'd like a bit of help, try the following.

run *spires

explain search demo

(do SEARCH DEMO 1, 2, 3, 4, and 5)

explain display demo

(do DISPLAY DEMO 1, 2, 3, 4, and 5 before trying on your own)

stop

tutorial

Computing Services
The University of Alberta

April 1983

T130.0483

Introduction to SPIRES Updating Class Notes

1 Purpose: Exposure to SPIRES file maintenance commands and techniques.

2 Prerequisites: Knowledge of MTS File Editor and SPIRES searching.

3 SPIRES Terminology

- SUBFILE - a data base consisting of data records and indexes
- DATA RECORD - all data elements relating to an item in the subfile, for example, an individual student record. Also known as 'goal record'.
- KEY - an element that uniquely identifies a particular data record; for example, a Social Insurance Number, a Student ID Number.
- DATA ELEMENT - a single named unit of information. For example, a student's name.
- ACTIVE FILE - an MTS line file used by SPIRES for either input or output. By default, SPIRES uses a temporary file called -SAF.
- FIXED - data elements that have a specified length and number of occurrences in every data record
- REQUIRED - data elements that vary in length, but must occur at least once in every data record
- OPTIONAL - data elements that may or may not occur in a data record
- DEFERRED QUEUE - a storage area where new, changed, and deleted records are kept while awaiting processing
- PROCESSING - taking records from the deferred queue and incorporating them into the main body of a SPIRES file, as well as building (or rebuilding) index records
- SPIBILD - the SPIRES processor that handles file processing

Introduction to SPIRES Updating Class Notes

and allows the addition or updating of a large group of records

- BATCH MODE - adding or updating a large number of records at one time, rather than individually
- SPIRES DEFAULT FORMAT - a general format for displaying records in a SPIRES subfile. Each element must begin with its name or a valid alias, followed by either a blank or an equal sign, which may be surrounded by blanks; each element must end with a semicolon. Any element whose value includes a semicolon must be enclosed by quotation marks ("). Any quotations marks within an element must be doubled, and the entire element value enclosed in quotation marks.

4 SPIRES Commands The commands you issue are shown below in uppercase; words typed in lowercase should be replaced as necessary. Square brackets ([]) group options, which may be specified as necessary. The or symbol (|) separates alternatives, only one of which may be used. Most SPIRES commands may be abbreviated to the first three characters.

- (1) SELECT subfile name - chooses a subfile for you to work with
- (2) SHOW SUBFILE SIZE - displays the number of data records in the subfile
- (3) SHOW ELEMENTS [DICTIONARY|NAMES] - SHOW ELEMENTS gives a list of the data element names defined for the subfile. SHOW ELEMENTS NAMES lists the data element names and aliases used; SHOW ELEMENTS DICTIONARY lists the data element names and aliases and indicates which are fixed, required, and optional.
- (4) CLEAR FORMATS - causes the SPIRES default format to be used
- (5) USE filename - causes *filename* to become the SPIRES active file
- (6) EDIT - allows the SPIRES active file to be edited, using the MTS File Editor. STOP returns to SPIRES.
- (7) :editor command - allows an editor command to be issued from SPIRES command mode
- (8) ADD [USING line-range] - ADD takes the contents of the active file and adds a new data record to the currently selected subfile. ADD USING line-range specifies a line-range to be used.
- (9) TRANSFER key [CLEAR] - TRANSFER key places a copy of the record identified by key in the active file; if the active file is not

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empty, you will be told the name of the current active file, and asked "OK to clear?". TRANSFER key CLEAR empties the active file before placing the copy of the desired record there.

- (10) UPDATE [USING line-range] [key] - UPDATE causes the contents of the active file to replace the data record previously transferred; UPDATE USING line-range uses only the lines named in *line-range*. UPDATE key updates the record identified by key; it need not have been previously transferred.
- (11) REMOVE key - removes the record identified by key from the selected subfile
- (12) ADDUPDATE - takes the contents of the active and adds the record if it does not already exist, or updates the record if it does
- (13) MERGE [USING line-range] key - MERGE takes the contents of the active file and uses them to replace, delete, or add appropriate elements to the data record identified by key. MERGE USING line-range uses only those lines included in *line-range*.
- (14) USING line-range - USING line-range is an option on the ADD, UPDATE, and MERGE commands that causes only those lines included in line-range to be used. *line-range* is specified as first/last, where *first* is the first line to be used, and *last* is the last. Note: both first and last are included in the lines used.
- (15) STOP - finishes the SPIRES session and returns you to MTS

5 SPIBILD Commands See the file BREN:SPIBILD.

6 Using SPIRES After signing on to MTS, issue the command:

```
run *spires
```

SPIRES prints the message of the day (if any), and indicates that it is ready to accept commands with the SPIRES prompt, '->'.

7 Using SPIBILD From SPIRES While in SPIRES, issue the command:

```
call spibild
```

You can return to SPIRES with the CALL SPIRES command.

8 Sample SPIRES Session To set up a sample SPIRES subfile to try adding and updating records, issue the MTS command:

Introduction to SPIRES Updating Class Notes

source bren:maillist

This will create a private subfile called "MAILING LIST" that you can use to try different ways of adding and updating records.

A sample SPIRES session is listed below. User input is printed in bold type; SPIRES responses in normal type; comments in *italics*.

```
#run *spires
# 14:25:10
```

-SPIRES 83.04

EXAMPLE 1

This example uses a protocol that helps add records to the RESTAURANT subfile. Search for a restaurant to see if it is already there, if it is, think of another restaurant to add.

```
->select restaurants
->find name la boheme
-ZERO RESULT This means la boheme is not in the
data base and can be added.
->..add.to.restaurant
:Would you like help in adding elements? yes
*
* THIS PROTOCOL COLLECTS AN ACTIVE FILE THAT CAN BE ADDED TO
* THE RESTAURANT FILE. Elements are labeled either 'required'
* or 'optional.' If you do not want to include an optional
* element, press return. To exit the protocol, press 'ATTN.'
* Note: You are collecting text in upper and lowercase.
*
:(Required) Restaurant Name? La Boheme
*
* Type the STREET ADDRESS
* The CITY and PROVINCE will be prompted separately.
*
:(Required) Street Address? 64 Street & 112 Avenue
:(Required) City & Province? Edmonton, Alberta
*
* Type the PHONE NUMBER in the form XXX-XXXX; do not use
* area codes.
*
:(Required) Phone? unknown
*
* type in the cost as:
*
* inexpensive, moderate, expensive
*
:(Required) cost range? expensive
*
* Type as many lines of COMMENTS as you wish.
* After you have finished your comments, press 'RETURN'
* IN RESPONSE TO THE NEXT 'FURTHER COMMENTS?' PROMPT.
```


Introduction to SPIRES Updating Class Notes

```
*
:(Optional) Comments? Good French and Continental food.
:Further Comments? Service is slightly slow.
*
* cuisine or type-of-food should be made up of as many
* descriptors from the following list as necessary.
* You should state nationality and specialty.
*
* NATIONALITY: GERMAN, WESTERN, ITALIAN, ETC.
* SPECIALTY: PIZZA, STEAK AND LOBSTER, ETC.
*
:(Required) type of food french
*
* state availability of parking
*
:(Optional) parking? On street
*
* For HOURS, use as many of these as are applicable
* Breakfast, Lunch, Dinner, All Day.
* you may include explanatory phrases:
*
:(Optional) Hours? Dinner
*
* For RESERVATIONS, one of these should appear:
* Required, Recommended, Unnecessary.
* You may include explanatory phrases.
*
:(Optional) Reservations? Recommended
*
* For WINE LIST, use only the most applicable from the
* following list:
* None, Beer, Wine, Cocktails.
*
:(Optional) Bar? Wine
*
* You now have part or all of a Restaurant Subfile record
* in your active file.
* Use Edit commands to list and edit the text you collected.
* Type the SPIRES command ADD to add the record to Restaurants.
* Type 'Continue XEQ' to resume the protocol.
*
-Type 'CONTINUE XEQ' to resume execution
X->edit
-Editing file -BLTZK
:print /file
:      1      NAME = La Boheme;
:      2      ADDRESS = 64 Street & 112 Avenue;
:      3      ADDRESS = Edmonton, Alberta;
:      4      PHONE = unknown;
:      5      cost = expensive;
:      6      COMMENTS =
:      7      Good French and Continental food. Service is
:      8      slightly slow.;
:      9      food=french;
```


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```
:      10      PARK = On street;
:      11      MEALS = Dinner;
:      12      RESERVATIONS = Recommended;
:      13      w1 = Wine;
:alter 5 'e'E'
:      5      cost = Expensive;
:alter 9 'fre'Fre'
:      9      food=French;
:stop
X->add
-Added record 327
X->cont xeq
*
:Would you like to add another record (yes or no)? no
* You will be returned to the Spires subfile you last selected.
->find name la boheme
-ZERO RESULT
Note: The result is still 0 because the added record is in the
deferred queue. It can be displayed by using the DISPLAY command.
->display 327
```

La Boheme

Type of food: French Price range: Expensive

Address: 64 Street & 112 Avenue

Phone: unknown

Parking: On street Open: Dinner

Wine list: Wine

Reservations: Recommended

Comments: Good French and Continental food. Service is slightly slow.

EXAMPLE 2 Updating

```
->clear format
->use -saf
->transfer 327
-SPIRES active file set to: -SAF
->edit
-Editing file -SAF
:print /file
:      1      ID = 327;
:      2      NAME = La Boheme;
:      3      PHONE = unknown;
:      4      COST = Expensive;
:      5      LOCATION = 64 Street & 112 Avenue;
```

Introduction to SPIRES Updating Class Notes

```
:      6      LOCATION = Edmonton, Alberta;
:      7      FOOD = French;
:      8      COMMENTS = Good French and Continental food. Service
-          is slightly slow. ;
:      9      MEALS = Dinner;
:     10      PARKING = On street;
:     11      RESERVATIONS = Recommended;
:     12      WINE-LIST = Wine;
:alter 3 'u'U'
:      3      PHONE = Unknown;
:stop
->update
->display 327
  ID = 327;
  NAME = La Boheme;
  PHONE = Unknown;
  COST = Expensive;
  LOCATION = 64 Street & 112 Avenue;
  LOCATION = Edmonton, Alberta;
  FOOD = French;
  COMMENTS = Good French and Continental food. Service is
slightly slow. ;
  MEALS = Dinner;
  PARKING = On street;
  RESERVATIONS = Recommended;
  WINE-LIST = Wine;
```

EXAMPLE 3

This example uses the system format \$prompt to add a record to the MAILING LIST subfile. This format is described more fully in SPIRES Searching and Updating T14, section D.6.

```
->select mailing list
->set format $prompt
->add
-SPIRES active file set to: -SAF
: DATE-ADDED      /n (/n means: skip to the next element)
: DATE-UPDATED    /n
: NAME            John Smith
: ADDRESS(1)      4753 - 23 Avenue
: ADDRESS(2)
: CITY            Edmonton
: PROVINCE        Alberta
: POSTAL-CODE     T6V 2N9
: COUNTRY
: COMMENTS
-Added record 1
```

EXAMPLE 4

Using the default SPIRES format

```
->clear format
```

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```
->empty
->edit
  -Editing file -SAF
  :i
?name Patricia Jones;
?address #302, 11436 - 121 Street
?city Edmonton;
?province Alberta;
?
:print /file
:      1      name Patricia Jones;
:      2      address #302, 11436 - 121 Street
:      3      city Edmonton;
:      4      province Alberta;
:append 2 ';'
:      2      address #302, 11436 - 121 Street;
:stop
->add
  -Added record 2
```

EXAMPLE 5

Processing and batch adding in SPIBILD

```
->call spibild
-Spires File Builder
-process maillist
-PASSING:      2 RECORDS OF REC-TYPE 01
              2 DEFQ RECORDS PROCESSED OF REC-TYPE 01
-COMPUTE TIME =      0.105 SECONDS
-ELAPSED TIME =      3.240 SECONDS
-stop
# 10:24:59 T=1.916 RC=0
#run *spires par=spibild
# 10:25:05
-Spires File Builder
-use mailadds
-edit
  -Editing file MAILADDS
```

Note the format, each record begins with the word add; and ends with a ; (semicolon) on a separate line.

```
:print /file
:      1      add;
:      2      name Ann's Yarn Shop;;
:      3      address 7312 - 101 Avenue;
:      4      city Edmonton;
:      5      province Alberta;
:      6      ;
:      7      add;
:      8      n Kinsie Wool Shop;
:      9      a 82 Edmonton Centre;
:     10      c Edmonton;
:     11      p Alberta;
:     12      ;
```

Introduction to SPIRES Updating Class Notes

```

:      13      add;
:      14      n Tika Woolcrafts;
:      15      a 10236 - 142 Street;
:      16      c Edmonton
:      17      p Alberta;
:      18      ;

:stop
-set exc -a
-batch mailing list
-PROCESSING FILE: CSID.MAILLIST
-COMPUTE TIME =      0.071 SECONDS
-ELAPSED TIME =      1.230 SECONDS
- ADD      1,      1 LINE      6.      KEY = 3
- ADD      2,      2 LINE      12.     KEY = 4
-Error while processing ELEM = PROVINCE
-Update Abort. Code=S419
-Error at or before line      18.
-*ADD      3,      2 LINE      18.
-PASSING:      2 RECORDS OF REC-TYPE 01
--- REQUESTS|SUCCESS
  ADD      3      2
  SUM      3      2
-COMPUTE TIME =      0.104 SECONDS
-ELAPSED TIME =      1.293 SECONDS

-use -a
-edit
-Editing file -A
:print /file
:      13      add;
:      14      n Tika Woolcrafts;
:      15      a 10236 - 142 Street;
:      16      c Edmonton
:      17      p Alberta;
:      18      ;
:append 16 ';'
:      16      c Edmonton;
:stop
-batch mailing list
-PROCESSING FILE: CSID.MAILLIST
-COMPUTE TIME =      0.072 SECONDS
-ELAPSED TIME =      1.663 SECONDS
- ADD      1,      1 LINE      18.     KEY = 5
-PASSING:      1 RECORDS OF REC-TYPE 01
--- REQUESTS|SUCCESS
  ADD      1      1
  SUM      1      1
-COMPUTE TIME =      0.088 SECONDS
-ELAPSED TIME =      1.190 SECONDS
-call
-821109: SPIRES documentation is online. SHOW NEWS for details.
-SPIRES 82.06

```

Introduction to SPIRES Updating Class Notes

EXAMPLE 6

Looking at all records in a subfile using Global FOR, and making corrections

```
->select mailing list
->for tree
+>display all
```

```
REC01 = 1;
DATE-ADDED = 01/05/83;
DATE-UPDATED = 01/06/83;
NAME = Smith, John;
ADDRESS = 4753 - 23 Avenue;
CITY = Edmonton;
PROVINCE = Alberta;
POSTAL-CODE = T6V2N9;
COUNTRY = CANADA;
```

```
REC01 = 2;
DATE-ADDED = 01/05/83;
DATE-UPDATED = 01/06/83;
NAME = Jones, Patricia;
ADDRESS = #302, 11436 - 121 Street;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;
```

```
REC01 = 3;
DATE-ADDED = 01/06/83;
DATE-UPDATED = 01/06/83;
NAME = Ann's Yarn Shop;;
ADDRESS = 7312 - 101 Avenue;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;
```

```
REC01 = 4;
DATE-ADDED = 01/06/83;
DATE-UPDATED = 01/06/83;
NAME = Shop, Kinsie Wool;
ADDRESS = 82 Edmonton Centre;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;
```

```
REC01 = 5;
DATE-ADDED = 01/06/83;
DATE-UPDATED = 01/06/83;
NAME = Woolcrafts, Tika;
ADDRESS = 10236 - 142 Street;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;
```

```
+>endfor
```

Introduction to SPIRES Updating Class Notes

```
-End of Global FOR
->transfer 4
-SPIRES active file set to: -SAF
->edit
-Editing file -SAF
:print /file
:      1      REC01 = 4;
:      2      DATE-ADDED = 01/06/83;
:      3      DATE-UPDATED = 01/06/83;
:      4      NAME = Shop, Kinsie Wool;
:      5      ADDRESS = 82 Edmonton Centre;
:      6      CITY = Edmonton;
:      7      PROVINCE = Alberta;
:      8      COUNTRY = CANADA;
:replace 4
: NAME = Shop, Kinsie Wool;
?n Kinsie Wool Shop,;
:      4      n Kinsie Wool Shop,;
:stop
->update
->transfer 5
-Active file: -SAF
-Clear it?yes
->:print /file
:      1      REC01 = 5;
:      2      DATE-ADDED = 01/06/83;
:      3      DATE-UPDATED = 01/06/83;
:      4      NAME = Woolcrafts, Tika;
:      5      ADDRESS = 10236 - 142 Street;
:      6      CITY = Edmonton;
:      7      PROVINCE = Alberta;
:      8      COUNTRY = CANADA;
->:replace 4
: NAME = Woolcrafts, Tika,;
?n Tika Woolcrafts;
:      4      n Tika Woolcrafts,;
->update
->call spibild
-Spires File Builder
-process maillist
-PASSING:      2 RECORDS OF REC-TYPE 01
      2 DEFQ RECORDS PROCESSED OF REC-TYPE 01
-COMPUTE TIME =      0.083 SECONDS
-ELAPSED TIME =      1.423 SECONDS
-call
-821109: SPIRES documentation is online. SHOW NEWS for details.
-SPIRES 82.06
->select mailing list
->for tree
+>display all

REC01 = 1;
DATE-ADDED = 01/05/83;
DATE-UPDATED = 01/06/83;
```


Introduction to SPIRES Updating Class Notes

NAME = Smith, John;
ADDRESS = 4753 - 23 Avenue;
CITY = Edmonton;
PROVINCE = Alberta;
POSTAL-CODE = T6V2N9;
COUNTRY = CANADA;

REC01 = 2;
DATE-ADDED = 01/05/83;
DATE-UPDATED = 01/06/83;
NAME = Jones, Patricia;
ADDRESS = #302, 11436 - 121 Street;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;

REC01 = 3;
DATE-ADDED = 01/06/83;
DATE-UPDATED = 01/06/83;
NAME = Ann's Yarn Shop,;
ADDRESS = 7312 - 101 Avenue;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;

REC01 = 4;
DATE-ADDED = 01/06/83;
DATE-UPDATED = 01/06/83;
NAME = Kinsie Wool Shop,;
ADDRESS = 82 Edmonton Centre;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;

REC01 = 5;
DATE-ADDED = 01/06/83;
DATE-UPDATED = 01/06/83;
NAME = Tika Woolcrafts,;
ADDRESS = 10236 - 142 Street;
CITY = Edmonton;
PROVINCE = Alberta;
COUNTRY = CANADA;

+>stop

10:39:35 T=1.355 RC=0

9 More Information

As you can see from this introduction, SPIRES is an extremely versatile system for subfile maintenance. If you are interested in learning more about SPIRES updating, you may purchase the manual *SPIRES Searching and Updating T14* at the University of Alberta Bookstore. Other topics are covered in the advanced sessions.

Introduction to SPIRES Updating Class Notes

If you would like more information about SPIRES, call the SPIRES Consultants at 432-3884.

SPIRES Commands

(Have you tried each of the following commands?)

`#$run *spires`

`->add`

`->transfer _____`

`->update`

`->stop`

`#$run *spires par=spibild`

`-use _____`

`-batch _____`

`-stop`

April 1983

0118.0483

SPIRES Access

SPIRES (Stanford Public Information Retrieval System) is a generalized computer information storage and retrieval system originally developed at Stanford University. An interactive system, SPIRES allows the user to create, maintain, and search stored information on the computer.

1 How to Run SPIRES

In order to run SPIRES, you need a computer account for a use of the University of Alberta computer, an Amdahl 5860, and access to a terminal. The steps in running the program are as follows:

- (1) Connect your terminal to the U of A system (MTS) by using the procedure described on page three of this write-up.
- (2) Sign on by using your signon ID and password.
- (3) Type in the following command:

```
run *spires
```

An example of a simple search in SPIRES would be:

```
#signon <csid>
#run *spires
-? select data library
-? show search terms
-? find keyword <keyword>
- RESULT: 3 DATABASES(S)
-? type
(The search result is displayed at your terminal)
-? stop
#signoff
```

2 How to Receive and Send Mail in Spires

The SPIRES mail facility is practical and easy to use. Occasionally when you sign on you may receive the message 'MAIL WAITING'. This means someone has used the SPIRES mail facility to send you a message. Issue the command:

```
-?show mail
```

and the message will be typed at your terminal.

SPIRES Access

After displaying the message SPIRES will ask you:

-EMPTY MAILBOX?

to which you respond 'YES' or 'NO' depending on whether you wish to keep or delete the message.

To send mail to another SPIRES user, put the message in the active file as shown below. SPIRES Active File (-SAF) is the SPIRES working file. Following this, switch to the MTS Editor mode and insert your message. You will then return to command mode and type:

send mail to account

where *account* is the signon ID of the user to whom you are sending mail.

The whole procedure is as follows:

```
#signon
#run *spires
-? empty
-SPIRES ACTIVE FILE SET TO: -SAF
-? edit
-EDITING FILE -SAF
: insert
? Enter your message,
? press the 'return'
? key each time you want
? to start another line.
? When you have finished
? your message, press
? 'return' twice.
: print/file
```

To review message before you send it.

```
1 Enter your message:
2 _____
3 _____
4 _____
5 _____
```

You can use the editor to change the text. Be careful with lowercase letters.

```
6 _____
7 _____
```

:alter 3 'each time'when'

This tells the editor to change the first occurrence of 'each time' to 'when' in line 3.

:replace 1 'Type after the "?"'

This tells the editor to replace line 1 with whatever is contained in the delimiters, in our case single quotes.

:insert 4 'Use this method.'

This insert command means insert the statement within delimiters after line 4 if line 4 exists or insert at line 4 if it doesn't.

:delete 1 4

This tells the editor to delete line 1,2,3, and 4.

:Stop

-? send mail to <csid>

3 How to Sign on via Datapac

For information on how to sign on to the MTS system via Datapac, refer to :

- (1) the attached write-up *Datapac Access* 0133.0483
- (2) the manual *Terminal User* 003.0881 which is available at the Bookstore.

April 1983

0133.0483

Datapac and Other Network Access to MTS

Our MTS system is a host computer on the Canadian Datapac Network. Datapac is a service offering of the Trans-Canada Telephone System (TCTS) and offers low-cost access to Datapac hosts from terminals in cities across the country. Datapac is considerably less expensive to use and has a much lower error rate than long distance telephone calls.

1 What Datapac Is

Datapac is a universal, shared, intelligent, packet switching network. TCTS views Datapac as the data communications parallel to its voice communications system. They foresee one network, coast to coast, permitting all types of users shared access to data and computing facilities.

The network is composed of nodes in different cities, each node containing one or more processors. The nodes are multiply connected to nodes in other cities via very high speed communications lines. The nodes contain Network Interface Machines (NIMs) which support connections to two types of customer equipment—host computers (Datapac 3000) and interactive terminals (Datapac 3101). We have a 9600 baud Datapac 3000 interface. Datapac 3101 can be accessed via 300 or 1200 baud public dial-up facilities in most cities (see list following) or via private lines to the NIM at up to 1200 baud.

2 Getting Connected to MTS

The description that follows covers the steps required to connect an interactive ASCII terminal to the NIM, the network, and to MTS.

- (1) Set the terminal to 300 or 1200 baud, half duplex, even parity, and power it on.
- (2) Dial the proper Datapac telephone number for your city (see following).
- (3) You should hear a high-pitched tone when the NIM answers your call.
- (4) Place your telephone handset in the acoustic coupler or press the dataset's DATA button.
- (5) Type in the characters . PERIOD and CARRIAGE RETURN—you may have to do this twice.
- (6) Datapac should respond with:

Datapac: xxxxxxxx

Datapac and Other Network Access to MTS

- where xxxxxxxx is the NIM line's number.
- (7) Type in the Datapac access number for Computing Services, 60100010, followed by a CARRIAGE RETURN.
 - (8) Datapac should respond with:

Datapac: CALL CONNECTED

and MTS should respond with the standard header:

UNIV OF ALBERTA COMPUTING SERVICES—C
MTS (0219-CF60/12/01)
%Enter terminal ID

- (9) You should now enter your terminal ID, sign on and proceed normally.

The above steps assume everything goes correctly. There may be problems with Datapac or with the availability of MTS on the network. Datapac problems such as not answering the phone call should be reported to the TCTS member telephone company in the city that you are in. If our network FECF is down, the message in step 8 would be:

Datapac: CALL CLEARED-DESTINATION NOT RESPONDING

In this case, hang up and try again later. (Don't forget about the time zone differences—MTS may not be up yet.) A list of other possible Datapac generated messages follows.

3 Terminal Handling

Terminals connected through Datapac generally speaking have available to them the same facilities as terminals connected to our FECFs by more conventional means. Datapac, however, is different and introduces a few minor changes, outlined below.

3.1 Password Masking The FECF is presently unable to turn off the automatic line adapter echoing of password or BLANKed characters input from a Datapac terminal. To hide these characters, the FECF outputs a password mask string to network terminals. This works for hardcopy terminals but is inadequate for CRTs. On a CRT switch your terminal to FULL DUPLEX while keying in a password.

3.2 End-of-Line Character The only ELC currently acceptable to Datapac NIMs is the CARRIAGE RETURN character.

Datapac and Other Network Access to MTS

3.3 Pre-entry of Input Lines Datapac will only allow preentry of two input lines from a terminal and will ring your terminal's bell if preentered characters are discarded by the network. We advise against preentry over Datapac since MTS prefix characters get confusingly out of order on your terminal.

3.4 Timing Dependent Operations Operations such as paper tape or cassette tape playback into MTS from a network terminal may encounter difficulties with the delays inherent in packet switching.

4 Network Problems

Terminals connected to MTS through Datapac are passing data via a considerably different route than normally connected terminals. When problems arise a different set of error messages may be output to your terminal (see following). Problems with or suggestions about the access to MTS through Datapac should be directed to Rolly Noel (369 General Services Building, (403) 432-2460, MTS ID NOEL).

5 Automatic Signoffs

Any MTS terminal connection inactive for one hour is automatically signed off.

5.1 Datapac Telephone Numbers The public dial telephone numbers for various Canadian cities are given below. The list of Datapac cities is growing and enquiries about additional coverage should be addressed to your local telephone company. You can SOURCE NET:DatapacINFO and enter PH to get the most recent list of Datapac dial-up telephone numbers. Outside these cities you can make a long distance call to the nearest Datapac Serving Exchange (DSE) location. The telephone numbers given for the larger cities are the lead numbers of rotaries so several ports are actually available.

DSE Location		Telephone Numbers		
Province	City	Area Code	300 BPS	1200 BPS
Alberta	Calgary	403	264-9340	232-0213
	Edmonton	403	420-0185	423-4463
	Fort McMurray	403	791-2884	
	Grande Prairie	403	539-5990	
	Lethbridge	403	329-8755	327-2004
	Medicine Hat	403	526-6587	
	Red Deer	403	343-7200	342-2208

Datapac and Other Network Access to MTS

British Columbia	Kamloops	604	374-5941	
	Kelowna	604	860-0331	
	Nelson	604	354-4411	
	Prince George	604	564-4060	
	Terrace	604	635-7221	
	Vancouver	604	683-8711	687-7144
	Victoria	604	388-9300	386-0900
Manitoba	Brandon	204	725-0878	
	Winnipeg	204	475-2740	474-2710
New Brunswick	Fredericton	506	454-9462	454-4525
	Moncton	506	854-7078	854-7510
	Saint John	506	693-7399	642-2231
Newfoundland	St. John's	709	726-4920	726-5501
Nova Scotia	Halifax	902	425-6931	429-9860
	Sydney	902	539-7010	
Ontario	Barrie	705	737-4100	
	Brampton	416	791-8900	791-8950
	Brantford	519	756-0000	
	Chatham	519	354-7710	
	Clarkson	416	823-6000	
	Cornwall	613	938-9700	
	Galt	519	622-1714	
	Guelph	519	836-7930	836-7960
	Hamilton	416	523-6800	523-6900
	Kingston	613	549-7720	549-7760
	Kitchener-Waterloo	519	579-0009	579-0310
	London	519	679-7500	679-7620
	Niagara Falls	416	357-2702	
	North Bay	705	476-3900	
	Oshawa	416	579-8920	579-8950
	Ottawa	613	567-9100	567-9300
	Peterborough	705	748-6940	
	St. Catharines	416	688-5620	
	Sarnia	519	336-9920	336-0950
	Sault Ste. Marie	705	942-4960	
	Sudbury	705	673-9602	
	Toronto	416	868-4000	868-4100
	Windsor	519	255-1000	
	Woodstock	519	485-5220	
	Charlottetown	902	569-3391	
Prince Edward Island	Granby	514	375-1240	
Quebec	Jonquiere/Chicoutimi	418	545-2272	545-2290
	Montreal	514	878-0450	878-0640
	Quebec City	418	647-4690	647-2691
	St. Hyacinthe	514	774-9270	
	Sherbrooke	819	566-2770	566-2990
	Trois Rivieres	819	373-2600	
	Moose Jaw	306	693-7611	
Saskatchewan	Regina	306	565-0111	565-0181
	Saskatoon	306	665-6660	665-7758

6 Network Generated Terminal Messages

All network-generated messages sent to a terminal connected to the Datapac network are of the form:

Datapac: <text>

The following is a complete list of <text> generated by the Datapac network.

7 Address

is your terminal's network address. This message indicates you are connected to Datapac—proceed with your call by entering an 8 digit host address and a CARRIAGE RETURN. Our host address is 60100010.

8 Call Connected

indicates your call has been successful.

9 Invalid Address

is sent when the format of the network address you enter is invalid.

10 More Than 12 Data Characters

indicates the optional user data field in your call request is too long. Trailing and embedded blanks are counted, but leading blanks are not.

11 Re-enter

indicates a local transmission error has occurred. You will have to re-enter the input line. If the problem persists place a trouble call to the telephone company.

12 Input Data Lost

indicates a transmission error has occurred. Since part of your input line has already been forwarded by the network you will have to enter the Delete-Line Character (defaults to _ UNDERSCORE) and reenter the line.

Datapac and Other Network Access to MTS

13 Parity Error

indicates a parity error occurred during line input. Repeat the character and continue line input. If the problem persists place a trouble call.

14 Input Error

indicates a network overrun problem. If the problem persists place a trouble call.

15 Call Cleared—<cause>

where <CAUSE> is one of:

15.1 Remote Directive MTS has cleared your call—likely after SIGNOFF.

15.2 Destination Busy All of the 32 logical channels of our Datapac host interface are busy—try again later.

15.3 Temporary Network Problem Something is wrong with Datapac—try again later. Place a trouble call if the problem persists.

15.4 Destination Not Responding MTS may be down—remember the time zone differences. Call the MTS operator if the problem persists ((403) 432-3982).

15.5 Address Not In Service The address in your call request was wrong: remember MTS is at 60100010.

15.6 Local Procedure Error A network protocol error has occurred at your end of the link—try calling again. Place a trouble call if the problem persists.

15.7 Remote Procedure Error A network protocol error has occurred at our end of the link—contact Rolly Noel (369 GSB, 403-432-2460, MTS ID NOEL) with the details.

15.8 Reset—By Destination indicates MTS has reset your circuit and some of your data may have been lost. If this persists contact Rolly Noel.

Datapac and Other Network Access to MTS

15.9 Reset—Temporary Network Problem indicates Datapac has reset your circuit—continue your session. Place a trouble call if the problem persists.

15.10 Reset—Local Procedure Error indicates the network encountered a protocol problem at your end of the link: continue. Place a trouble call if the problem persists.

16 Datapac Trouble Numbers

Problems with your local telephone service such as no dial tone, reaching wrong number, etc., should be reported as indicated in your local telephone directory.

Include the following information with a trouble call:

the network message,
your name, address, city, and telephone number,
a description of the problem,
the time and date it occurred.

Alberta	Calgary	(403) 265-6703
	Edmonton	(403) 429-5502
British Columbia		(604) 688-0181
Manitoba		(204) 475-3333
New Brunswick		(800) 222-9734
Newfoundland		(709) 753-2150
Nova Scotia		(902) 421-4171
Ontario	London, area code 519 & 416	(800) 265-5925
	Toronto	(416) 862-1717
	Ottawa & area code 705	(613) 238-3103 or
		(800) 267-9502
Prince Edward Island		(902) 894-7313
Quebec	Montreal	(514) 875-1880
Quebec		(418) 694-1010
Saskatchewan		(306) 569-2650

17 TELENET Access to MTS

Datapac has an interface (gateway) to the Telenet network. This enables terminals in the United States, Mexico, and western Europe to access MTS via Telenet/Datapac.

From MTS you can SOURCE NET:TELENETNOS (use ID of PHONES and the password of PHONES) to list the current telephone numbers of Telenet dial-up ports.

Datapac and Other Network Access to MTS

To connect over Telenet from the US:

Dial the local Telenet number and connect your dataset
input two CARRIAGE RETURNS
enter a CARRIAGE RETURN when asked for the terminal type
enter the command C 20423 to connect to MTS
enter your terminal ID and sign on normally

For more information contact Telenet Customer Service (telephone
800-424-9458 or 202-347-2424).

18 TYMNET Access to MTS

Datapac also has a gateway to the Tymnet network with similar coverage
as Telenet. For information contact them at 408-446-7000. Our
network address on Tymnet is 3020;;60100010.